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SOME PHASES OF FUTURE GEOGRAPHICAL WORK IN AMERICA.*

BY

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Though many of our geographers give most attention to special phases of their study, there is a common ground upon which all should stand. The geographical needs of America are great. Most of our teachers are so deficient in knowledge of the subject that our general educational standards are low. Geography, on the whole, occupies a low plane. We know of no way to improve these conditions in which the efforts and influence of the working geographers shall not be paramount. This is a duty that our geographers owe to their study; and there is nothing that will bring them into closer touch, that will make their united influence in such Associations as ours more effective, than to work together, not as experts in this or that department of the study, but as geographers, pure and simple, who have a common interest in the improvement of geographical conditions and who desire and expect to participate in the promotion of all approved measures designed to bring about better conditions.

We should like to see geography mean as much in America as in other lands. Not merely that we wish our study to attain the same advanced position it has reached elsewhere; not merely that we desire its recognition at home as in the leading countries of Europe, as an important agent in training the intellect and imparting knowledge. These are laudable aspirations, but they are only the means to a greater good.

We all know that among the earth studies there is none which is so closely in touch with the daily life and work of the millions as geography; and yet, in many aspects of this study we lag behind the other leading nations, with the result that we lack in our homes, our

*President's Address before the Association of American Geographers, New York, Dec. 31, 1906.

business offices and publishing houses, and in very many of our schools and libraries the conveniences common in some countries for obtaining accurate geographical information. More than this, many educated persons, uncritical in our study—for they have had no geographical training—accept and use in their work the most misleading statements, geography that is not true.

The primal reason for this condition is, I think, not far to seek. Geography, in its present aspects, is a thing of yesterday. The middle-aged members of our Association were ten to fifteen years old when the two great founders of the new geography died. Both Humboldt and Ritter had seen what geography would come to be. They had pruned away many of its errors. They had founded a rational geography, applied new method to the subject and established its high rank among the studies; but when both died, in 1859, we scarcely knew of the revolution that had come to pass. Comparatively few of our educated men and women could either read or speak German or French. The new geography had come, but it had not touched us.

Continental Europe was impressed with its practical value, and this view of geography has been the most forceful influence in promoting the study abroad. The new geography has, indeed, practical value, and both its basis and its method are scientific. It is geographical truth that the world needs. It is the attainable approximation to the truth that real geography supplies.

Though this influence was long in reaching us, though it failed for decades to supply any stimulation to American geography, we have felt it now for years, and with helpful results. In physical geography, and especially in the study of the forms of the earth's crust and their genesis; in the cartographic and other geographical products of our national surveys, we have won international standing and respect. We have made growth all along the line. Still, we have not brought about a realization of the manifold utilities of geography; and it is this failure that we should emphasize if we would bring about a change in educational policies that have subordinated instruction in many phases of geography and in the arts allied with them.

Does any one believe for a moment that this nation of vast achievement is always to be powerless to produce general atlas sheets, which alone are within the reach of the masses, that will tell the truth about our own domain; that we shall not stand upon a higher plane in so far as geography enters into our thought and work? No one believes this. We shall have in America whatever benefit the study of geography can bring to any man. We shall have it through organized, systematic, patient effort—the kind of work that is to-day changing the position of geography in Great Britain.

I paraphrase the remarks of the President of the Royal Geographical Society at the York meeting of the British Association this year in saying that, twenty-five years ago, a true conception of the scope and service of geography was confined in Great Britain to a small circle of specialists. Progress began after Dr. Keltie had studied the methods and meaning of geographical instruction in the schools and universities of the continent, and had shown in his exhaustive report how poor and inadequate, comparatively, were the insular methods of tuition. There was not an institution in Great Britain where thorough training in geography might be obtained. Little importance was attached to the study in educational circles.

As the result of that report and the influences it stimulated, much progress has been made. The output of the commercial map firms, the text-books and school maps, have been greatly improved. Geography has been firmly established, and is growing in Oxford and Cambridge and in other of the higher schools. Better methods of instruction have been widely introduced, new geographers of talent are among the fruits; and President Goldie read a list of books and papers as specimens of the recent literary output produced under the stimulus of scientific methods applied to geographical study.

In other words, the geographical atmosphere bids fair to pervade Great Britain—the atmosphere that in a half-dozen countries of the continent has stimulated aptitude and talent and has favoured the development of men of genius who, from time to time, have rendered epoch-making service to geography.

We may refer here to some of the disadvantages under which we labour. The largest and best geographical output naturally comes from countries that have the best facilities for training geographers. Some young men, one within the past two months, have sought in vain for tuition at home that would make them competent to do good pioneer field work, and especially to lay down routes accurately enough for the purposes of good preliminary maps. Others, like Donaldson Smith, years ago, have found this tuition abroad; too many in our geographical history have gone into the field without it.

When we have the various facilities to train men for the service they wish to render, much work, now poorly done, will be ready for those who are fitted to do it well.

The German encyclopedias are noted for adequate treatment of geographical topics. Their publishers are able to employ the best collaboration in this line. Many hundreds of the lesser titles are in the hands of young men fresh from the schools, but their critical sense has been developed; they know where to go for the best geographical information, the authoritative data.

In America, many of the most important topics are assigned to specialists who are adequate for the work; but, unfortunately, it has been the practice to put the great mass of ordinary geographical titles in the hands of young men who have no special equipment. They have a certain space to fill, and fill it with the cursory information they chance to hit upon in the libraries. It is a perfunctory task, unillumined by a gleam of trained intelligence. This is the kind of geographical pabulum with which our reference books have been overcrowded; and it has been inevitable, because competent collaboration, to this day, cannot be procured for this service.

Until recently we never had a geographical Gazetteer worthy of the name. Now we have an opportunity to see, in a recent volume of home production, how true to the mark, on the whole, a book of this sort may be, when its pages are controlled by geographical proficiency.

The cause of popular geography may be pleaded with earnestness and with dignity by the highest authorities in our study. When the opinion was expressed that the geographical news and comment in a certain London newspaper were as adequate as those of the geographical periodicals, Henry M. Stanley replied that they might well be, for they were in the hands of a distinguished member of the staff of the Royal Geographical Society. The names of leading geographers of Europe are often signed to newspaper articles. The lucid and able account of Antarctic exploration by Dr. Penck was none the less worthy of his pen because it was written for the readers of a German newspaper. Our editors say that if timely geographical topics are treated by specialists in an interesting manner they will welcome their contributions. But the volunteers are few. Our geographers are comparatively few, and among those we have few who are specially equipped to treat the various phases of regional geography. Most newspaper geography teems with error and platitude. We shall see this class of writing on a higher plane when conditions permit.

The public does not get what it pays for when the geographical misinformation supplied by some Government bureaus is a conspicuous percentage of the whole letter-press. Outside the bureaus especially devoted to the earth studies, the geographical standard in our Government publications is low. They need geographical editors and they cannot get them. Maps have been issued within the past few weeks in some of these publications giving natural scales which do not agree with the scales of miles to the inch. We are just informed that a railroad is now building between the Congo

and the Nile, the fact being that the road is still merely a project. Many such statements are spread broadcast through the press on the authority of our Government publications.

No country in the world could offer better opportunities than our own for trained talent in the various lines of geography and cartography if our scientific and technical schools had the facilities for turning out first-rate men with first-class equipment. Perhaps our Government surveys cannot provide all the men to meet the demand in the Philippines for triangulation base maps. Mr. McCaskey, chief of the Philippines Mining Bureau, in his last report, says that the railroad, highway, and other surveys are embarrassed because topographical data are almost wholly wanting. The public land surveys and surveys of mining claims are almost at a standstill for need of triangulation base maps, without which boundary troubles will arise.

How are such emergencies met elsewhere? Barbarous tropical Africa seems now to possess greater advantages. The mapping there is uneven in merit; but much of it is very remarkable, considering that, thirty years ago, not even a route survey had been pushed through many of these regions. No detail has been made from the German survey and cartographic staffs to produce these fine reconnaissance maps, for in the Colonial service are men enough, trained in the universities and technical schools, to carry out the work. These survey parties are gradually covering German East Africa, Togo, and the Cameroons. Considerable areas have been triangulated. Nearly every route is tied to fixed positions. Many of the sheets of small areas contain the work on 30 to 40 routes. Topographic, economic, and cultural features are prominent on these sheets. When the map of Togo is completed it will be the best-mapped part of tropical Africa. The whole of this colony is being mapped on a scale of 1:200,000, and some of the later sheets have been produced on double that scale, because the information required it. The French are making almost equally good preliminary surveys of large regions in Africa.

We should like to see all of our official home maps at least equal in excellence to these African sheets. The economic and other maps of our State geological surveys show the widest diversity of quality. It is a disfiguration of scientific work to illustrate it with the maps made for some of these survey reports. No maps should be more carefully produced than those of the State surveys, because, usually, the facts they are meant to illustrate come closer to the special needs of the people concerned than those collected by our national surveys. One of our State surveys has recently been studying the distribution

of road-making materials, and has collected a large amount of very valuable data. It prints no road map of the State to show the geographical relations between these materials and the roads they may most conveniently repair. I cannot find that in the many years of its existence this survey has ever printed a State road map. It, however, accompanies its voluminous report with a few county road maps so badly done that it is almost impossible to read them. This is waste of money and sacrifice of opportunity. On the other hand, some of the State surveys, even before the topographical surveys had been far advanced in their territories, found means to evolve maps of their States in geological, economic, and other aspects that were highly creditable.

The State survey maps should be among the most helpful allies of geographical education. Many a bright schoolboy has special pride in his own State; and maps showing the facts that have shaped the distribution of population, the development of industry, the location of towns, and the nature and direction of transportation—the facts that are especially appropriate to State survey sheets—will often be studied with delight. Even with our present cartographic facilities it is within the province and the power of our State surveys so to produce their maps that many of them will help to cultivate the habit of map-reading and the love of good maps.

I do not predict that our national and State Governments may some day go as far as some foreign Governments which have deemed it so important that their school children should obtain intelligent conceptions of the geography of their own countries that they have participated themselves in the work of supplying much material for the class-room. Thus Italy has purchased with public funds hundreds of relief models of the kingdom and placed them in the secondary schools. The Swiss Government completed in 1900 a large wall-map of the Republic on a scale of 1:200,000 for school use—a fine example of modern cartography, now used in the class-rooms throughout the country. A number of the Cantons, desiring that the students should have special facilities for the study of their own home territory, have produced, at their own expense, equally fine maps of their own area on a scale from two to three times as large as that of the national school map of Switzerland. The Swiss Government has recently appropriated $20,000 for the preparation of a school atlas.

If I dwell at some length on the subject of maps it is because, as far as I can discover, the advance in the scientific value and the mechanical and artistic presentation of geographical facts on maps has been contemporaneous with or precedent to improvement in the

educational position of the subject in all countries. Dr. Wagner has said that he derived a large part of his preparation for the writing of his great work, the *Lehrbuch,* from the study of maps. When Dr. Petermann, in the sixties, wrote his monograph on the state of our knowledge of Africa he said that if it had not been for the years of labour which Bruno Hassenstein, the famous cartographer, had given to the compilation of African maps, he could not have carried out his idea. No greater pains are bestowed upon the preparation and revision of the standard atlases of Europe than are given to the best school atlases. The author of the Sydow-Wagner school atlas has said that the frequent revisions of this work involve enormous labour. Some of the best text-books now refer on almost every page to this or that map in one or another of the standard school atlases, just as our geological text-books refer to Dana's Manual, or other reference works.

Geography will not reach the position we wish it to attain in America until we begin to teach the children in the lowest grades what a good map is. As their education advances so will their appreciation of the beautiful devices by which the cartographer unfolds before them on a little sheet the truth about the forms of the land, the contours of the ocean floor, and all the many aspects of the earth. They will learn to love good maps, will be satisfied with nothing less, and when the demand comes there will be a supply to meet it.

Few of the maps of our commercial map houses subserve well the interests either of business or of education. Their influence is often vicious because they give much that is not fact; they are poverty-stricken because they omit so much of the truth, their compilers not knowing where to go for it. The best and latest map of Cuba made by one of our map firms is an illustration. The materials for making a good map of Cuba are by no means adequate, but the hydrographic surveys give all necessary information for the correct mapping of the coasts, and of the coral reef, so vital a matter in the navigation of the coastal waters. This map gives no intimation that there are long stretches of reef around these shores; and the Sierra Maestra of the south-east coast might be thought to stand there under Saharan conditions, for not one of the many rivers draining the slopes is shown. Compare this map of Cuba throughout with any of the best maps on practically the same scale and you will find that the home product, sold at a good price, is very inferior. The prevalence of such work is a great evil, permeating an important branch of our industry and commerce. It is the imposition upon the ignorant of poor goods represented as first-class. The remedy for it will come only in the progress of geographical education.

Our school maps have made considerable improvement in the past fifteen years, especially in their more tasteful and pleasing appearance and, to a lesser extent, in the more scientific quality of their contents. If they are still far below the standard established by maps in which the best devices and skill of the cartographer and the supervision of the geographical expert have collaborated to give a superior result, there is evidence, at least, that we are almost half way between what we used to do in this line and what we shall some day achieve.

Though our map firms still use the wax process which is no longer employed in the leading cartographic houses abroad, we are able to secure passable results by incessant watchfulness and within the limits of our expertness in geographical supervision. A worker in wood or in iron must know the ins and outs of his business or his competitors will leave him behind. Superior maps are the finest condensed expression, the epitome of geographical knowledge, but our map firms are not able to supply the essence that determines quality, the critical selection of the facts that should appear in their maps. Book publishers feel this deficiency acutely, for it costs them dear. They are unable themselves to pass upon the quality of a map and they find competent geographical supervision very difficult to procure. One firm said recently that it would cost thousands of dollars to replace or revise the plates that had been made for them. Some publishers investigated the possibility of having their maps made abroad, where geographical supervision is included in the cost of the plates. They find that these finished products may be made for them with geographical supervision and that the cost, *plus* the duty, is about the same as that of inferior American plates on which the publisher may pay extra for the expert supervision. But here's the rub. Publishers say they cannot get copyright on map plates made abroad. In other words, the law practically prevents the manufacture abroad for American purposes of a superior product, even though it cannot be produced at home.

One of our geographical societies recently decided to show our people what a fine atlas sheet, even on a small scale, may be made with topographic sheets of our Geological Survey as a basis. The Catskill plateau and a part of the Hudson River plain were selected for the work, and the result is a scientific map, pleasing in every aspect, every square inch of which is the intelligent, the accurate expression of geographical and cultural facts. So excellent a map cannot be generalized from the same data by any American map house. We should multiply such maps if possible, as a part of the effective material in the educational campaign that must be waged.

Mr. J. Paul Goode writes: "In geography we are constantly using maps; and upon them must be based a necessarily large part of our work in geography." Prof. Dryer has said: "Our school laboratory work includes much attention to the study of maps, and perhaps especially to the study of contoured topographic maps and of models in relief, illustrating various parts of the earth's surface." But are many of our teachers yet provided with the facilities for impressing upon their students the qualities that distinguish the good from the poor atlas sheet? Are they yet able to insist effectively upon the provision of good map material only in text-books and school wall maps? A poor map is a bad feature of class-room equipment; and its influence is detrimental unless the teacher is able to point out the sins of omission and commission and apply the corrective.

What is needed to make geography, in America, render at last its full measure of usefulness? Agitation in the best meaning of that term is needed—the proper word and influence at the right time and place by the large body of working geographers, each of whom shall consider himself a member of a committee of the whole, with a personal duty to give a little time from his own special topic to the consideration and promotion of the interests of the whole cause of geography. I have never been able to see the futility of any well-planned, well-directed effort, even though an humble one, to render some service in this line.

Some eighteen years ago a committee was formed in the Brooklyn Institute to make a collection of the appliances used for geographical education in the leading countries of Europe, the idea being that the exhibition of the collection at home might stimulate improvement in our own appliances. There was not a geographer on the committee, though there were earnest students. The collection was the largest one of the kind, was exhibited in several of our leading cities, and is now in the Museum of the Brooklyn Institute. It had its influence, which still persists. From it dates the effort of several of our map houses to improve their school products. Their representatives were at the exhibitions, note-book in hand. In two months the leading map house advertised itself as the agent for the sale of the finest series of European productions. Many foreign maps were introduced, especially in the private schools. Its influence probably would have been wider and deeper if educators had been in a position to take advantage of the auspicious moment.

A teacher of German training who made a valuable suggestion to a certain map house, writes: "With such indifference of publishers to new suggestions, what are we poor theorists to do?" I think we

might reply: "Make more suggestions when a proper opportunity seems to offer." This same firm said, eighteen years ago: "We have grown rich selling our products to the American people, and we are satisfied as long as they are." A little later this firm saw signs of educational discontent, and no map house has been more active in the endeavour to improve its products.

As a rule, if we tell any map firm that it should add this or that to its reference material we shall find in a month or two that the material has been purchased. These houses are sensitive to criticism; they welcome suggestion. Unfortunately, they have not the equipment either in men or in machinery to make many suggestions for improvement effective. One of the houses where the better mechanical results may be obtained says that it intends to add geographical supervision to its facilities. We may welcome this endeavour, though we have no illusions as to the work it involves. When we recall that the leading map house of Europe has a library of 80,000 volumes, a collection of 150,000 maps so indexed that any information desired is at once available, and the highest efficiency in its working force, we know that we must wait with patience for the better things. None of our geographical activities can go far towards realization of the full benefits they should confer upon the nation until a change is brought about in the educational attitude towards geography.

We want young men to become thoroughly grounded in the principles of geography in university courses and then to teach these principles in the normal schools and the methods of applying them in educational work. Oxford and Cambridge saw no need for geography. It was only through persistent effort and weighty influence that a tentative place was given to it. Its roots have struck in, and it is in those institutions to stay. We are told by geographers that our study can never have the place in our universities that it occupies abroad. How do we know this? The subject is growing abroad; it lacks no vitality there. When Dr. Keltie made his report there were fifteen Chairs of Geography in the German universities. This winter the subject is represented in 22 German universities, with 32 professors, 13 tutors and 3 lecturers. We have already a foothold in our universities, and who shall say that it cannot be strengthened and widened? Are these institutions aware of the benefits that would accrue to the whole people by placing cartography and other departments of geography, which now lag behind, on a scientific basis? A university professor expressed his astonishment last summer when it was intimated that a course in regional

geography, another in physiography, and another in pedagogic method did not fully represent the interests of geography. "Why," he said, "I thought geography was fully represented in our university."

When the British Antarctic Committee seemed to have reached the end of its ability to raise another dollar, the sum of $125,000 came from a wholly unexpected source and completed the fund. I do not believe we can ever predict the good results of strong and persistent effort in an excellent cause.

It is to be expected that in the course of our geographical progress the general helpfulness of geographical workers in the cause of improvement will be greatly enhanced. We may be glad to welcome new Societies, for, in the future, they will be more useful than ever before to geographical interests.

Three or four new Societies have been added to our list in a few years, and there should be room for them in every important centre of population. We cannot measure the usefulness of these Societies by the number of their members or the condition of their bank accounts. All honour to the men who give of their substance to make great geographical collections and house them commodiously. They build wide the foundations on which to enlarge the geographical activities of their Societies. But, rich or poor, a Society is judged by the quality of its work. Some geographical Societies of Europe occupy leased quarters and open their libraries only at appointed hours; but they have organized with much scientific success meetings of the International Geographical Congresses.

The periodicals of our Societies should more and more become the clearing-houses for our best literary productions. Serving this end, they should have a favourable influence upon the work of our less practised but promising young writers. The periodicals also should help to develop, what we greatly need, a larger body of competent critics of geographical literature. In some departments it is still difficult to secure at home an adequate number of good reviewers. When this work is adequately performed it is full of suggestion and value. Very many of the most experienced geographers abroad write book reviews, and this fact has given special importance to the review departments of some of the leading European journals.

If any considerable number of our working geographers find little time to note the new ideas, publications, and other activities in other lands, it would help to widen their horizon if the world movement in geography might adequately be summarized, from time to time, in one of our periodicals. Such reviews of the whole field would pro-

bably tend to stimulate some of our younger workers to strive for the geographical versatility that is so conspicuously useful in Europe—such development of attainment, for example, as that which enabled Sapper, our leading authority on Central American geography, to map and describe one of the Canaries and part of another in most of their geographical aspects, and as the result of a single vacation journey. The geographical atmosphere in some European countries seems to foster the development of this remarkable variety of geographical attainment in many of their most distinguished students. Wagner is famous not only in cartography and mathematical geography, but also in regional and statistical geography. Penck is lecturing this winter on mathematical and African geography, cartography, and oceanography. There will be more and more demand at home for the geographer of broadest equipment; and when his kind is more numerous there will be fewer misgivings lest geographical specialists shall not find common ground upon which to stand together.

Our Constitution names among the objects of the Association the development of better conditions for the study of geography in schools, colleges, and universities and of an intelligent interest in geography among the people of North America. It is not too early for us to ask ourselves how we may be helpful in these directions. There is no doubt that the working geographers of the country may be helpful. But first we want some exact and recent data. To what extent is superior map material now used in our schools? How is map-reading taught? How much stress is placed upon the importance of inculcating an appreciation of good maps and knowledge of the qualities that make them good? What is the attitude of universities and colleges towards the study of geography in these institutions? These are among the practical topics of great present interest.

If my judgment is sustained as to the timeliness of such inquiries as these, I trust that steps will be taken towards securing reports of such investigations for our meeting next winter. When we have collected evidence as to the exact present condition of geographical education we shall be in a better position to seek the means for improving conditions.*

* The Association, at its business meeting, authorized the Council to start lines of inquiry which, in its opinion, would be helpful to such measures as the Association may decide to promote for the improvement of geographical conditions.

TOPOGRAPHIC SURVEYS IN THE UNITED STATES.

BY

H. M. WILSON.

A conference held recently in Washington between Messrs. Henry Gannett, geographer of the United States Geological Survey, Frank Bond, chief draftsman of the General Land Office, and Charles S. Sloane, geographer of the Census, resulted in the careful perusal of official records or areas of the various States and Territories of the United States, and of the latter as a whole. The result has been the adoption of areas for each which will doubtless be accepted as authentic until the topographic survey of the total area of the United States shall have been completed. Of the newly-accepted area of the United States, 3,026,789 square miles, the United States Geological Survey has completed topographic maps of about 1,025,000 square miles, or a little over one-third of the total area. Of this a large proportion has been mapped only in a reconnaissance way, on the small scale of about four miles to one inch and with a contour interval of 200 ft. Also, a large portion of the work done prior to 1890, on the scale of two miles to one inch, is of reconnaissance character, lacking as it does the spirit levelling necessary to render the results at all final. It is therefore evident that the work of making a topographic map of the whole United States is yet far from completed in spite of the really rapid progress being made.

Annually for several years past the United States Geological Survery has averaged about 35,000 miles of completed topographic surveying. This is equal to the annual mapping of a state nearly the size of Indiana, and greater than Maine or South Carolina. It is an area nearly equal that of Portugal and as great as that of Switzerland and Denmark combined, yet it is scarce one one-hundredth of the total area of the United States exclusive of Alaska. The total appropriation to these topographic surveys is $350,000 per annum and the cost has for the last few years averaged about $10 per square mile, exclusive of the more detailed work done in such States as have co-operation, where larger scale maps are made and more work is done to an amount about equal to the financial contribution from such co-operation States.

The topographic mapping of the States of Connecticut, Massachusetts, New Jersey, and Rhode Island has been completed; that

of West Virginia will have been completed at the close of this year; that of some of the other States is rapidly approaching completion. The exact area of these States is now known, that of Connecticut being 5,047.24 square miles, of Massachusetts 8,331.50 square miles, of New Jersey 7,886, and of Rhode Island 1,130.85. These areas include what is classed as land area only, excluding large bodies of water bordering on natural boundaries or the open ocean, but including all rivers and the smaller lakes, following the shore-line and jumping only from head-land to head-land, across necks or straits less than 1,000 ft. in width; thus, in Connecticut that portion of the State line within Long Island Sound is excluded.

In recent years the appropriations made by Congress for topographic surveys by the United States Geological Survey have been helped out in a number of States where co-operation has been had through legislative enactment. In such States as those enumerated, larger amounts of Federal funds have been expended for a few years, thus expediting the completion of the mapping of their areas. The consequent result has been to retard work temporarily in non-co-operating States, but upon the completion of work in co-operating States to free larger sums for expenditure elsewhere. At present the Federal Survey is co-operating with about sixteen States, chiefly through State Geologists, and in such wise that the results of the topographic mapping credit clearly in the titles on the maps the State co-operation. The results are available to the States for the prosecution of their economic studies, at the same time that they are available to the United States for its more general work of geologic mapping, soil surveys, military uses, and for the study of forestry and hydrographic resources.

In the eastern portion of the United States during the past season work was pushed with especial vigour in the States of Ohio, Pennsylvania, Illinois, West Virginia, Kentucky and New York, where liberal appropriations toward co-operation were available. The results of the season may be summarized as follows:

In Alabama a portion of the reconnaissance map about Bessemer was replaced by detailed topographic mapping of an area of about 250 square miles, chiefly in Shelby County. The results of this work will be of great assistance to the State Geologist in connection with his studies of the iron and coal deposits contiguous to Birmingham and Bessemer, as well as the extensive steel industries of that important region. Near the Georgia line the Opelika quadrangle has been mapped, covering an area of new survey aggregating about 800 square miles in Alabama in the counties of Chambers and Lee, and

200 square miles in Georgia. The results of this work will be useful not only to the State Geological Survey but also to investors in both States, and especially to the city of Columbus, Georgia, where there is great interest in the development of the water power of the Chattahoochee River.

In Georgia, in addition to the work on the Opelika quadrangle, an area of about 250 square miles was surveyed in detail over portions of the old reconnaissance map of Cartersville, chiefly in Bartow and Cherokee Counties. The results of this work will be used in studying the iron and other valuable mineral deposits near Cartersville. A beginning was made in Muscogee County of the survey of the Columbus quadrangle.

In Illinois, in co-operation with the Director of the State Geological Survey, Dr. H. Foster Bain, several areas of importance were mapped. An atlas sheet of about 200 square miles near Waukegan in Lake County was surveyed, the results of which are especially desired for educational purposes by the University at Evansville. For like reasons an area of about 250 square miles was surveyed about Wheaton, covering the larger unmapped portion of Dupage County. West of Springfield an equal area was mapped to be utilized by the State Survey in the study of the extension of the coal fields of that region. For like reasons and in connection with the study of the extension southwestward of the south-central coal body of Illinois, areas of 250 square miles each were mapped about Galatia, chiefly in Saline County, and Breese in Clinton County. A beginning was made in the mapping of areas in northwestern Illinois about Galena, where the State Geologist is interested in the study of the important mineral resources of the region. A large amount of important preliminary work was done in the State, chiefly the determination of geodetic positions by primary traverse, and an extension of the precise level net by the running of a line north and south near the eastern edge of the State, so that now, in conjunction with the precise levels run heretofore by the Army engineers on the Mississippi and Illinois Rivers and by the Coast Survey, the State of Illinois is well gridironed with lines of precise levels which will be useful in reducing future elevations to mean sea-level. Another line of precise levels was run from near Olney, eastward across the southern end of the State to Shawneetown.

In Indiana a beginning was made on the topographic survey of important new areas about Bloomington and Saline City. The former was made chiefly at the instance of the officials of the University of Indiana, and will produce a valuable base map for the study

of the important oölitic limestone deposits found there, and the latter will be found useful by the State Geologist in connection with studies of the coal deposits of southwestern Indiana. A line of precise levels was run from the Coast Survey bench mark south of Bloomington, through Terre Haute to connect with the system in Illinois near Danville.

Surveys were continued in Iowa, consisting chiefly in the mapping of an area of 225 square miles, west of Des Moines. This will be utilized by the State and Federal Surveys in the study of the coal of that region.

In the neighbourhood of Leavenworth, Kansas, and chiefly in the interests of the Army School of Instruction at Ft. Leavenworth, topographic surveying was commenced on the large scale of three inches to one mile of an area of about 400 square miles. This includes the Government military reservation at Ft. Leavenworth, and will be utilized in instruction in military tactics, engineering and surveying by the Army School.

In Kentucky topographic mapping was prosecuted with some vigour in co-operation with the State Geologist, Dr. G. J. Norwood. The State Geological Survey was especially desirous of procuring base maps on which to study some of the more important problems connected with the coal, oil and fluorspar deposits of the State. To this end an area of about 150 square miles was mapped in western Kentucky, chiefly in Webster and Hopkins Counties. An equal area was mapped in southwestern Kentucky, near Monticello, and areas of 250 square miles each were mapped in the celebrated Blue-grass region near Lexington, Georgetown, Frankfort and Owenton. In addition a large amount of preliminary work was done, including the determining of geodetic positions by primary traverse and triangulation and the running of a line of precise levels from Winchester southeast into the celebrated feudal region in Breathitt County. This is in connection with the proposed re-survey in more detail of the old reconnaissance mapwork where the development of coal, oil and gas is now so active.

In Louisiana the topographic map of 250 square miles in Winn County is approaching completion. This work is being executed in co-operation with State Geologist G. D. Harris, who is greatly interested in the results in connection with important studies of economic problems. The resulting base map will also be utilized by the Bureau of Soils of the Department of Agriculture in the study of the soil qualities of this region.

In Maine an area of 300 square miles was mapped about the

important industrial centres of Lewiston and Auburn, and including the noted health resort at Portland Springs. This work was done in co-operation with the State Survey Commission, of which Prof. Leslie A. Lee is chairman, and at whose instance preliminary work was extended over an area of 500 square miles in western Maine in the neighbourhood of Fryeburg. In addition to this an important line of precise levels was run from near Portland to Fryeburg, which line was extended across New Hampshire to the Connecticut River, where connection was made with a similar line run a few years ago from Portsmouth *via* Manchester and Concord across New Hampshire. The result of these lines of precise levels has been to bring sea-level elevations into all the southern and central portions of New Hampshire and into eastern Vermont. In addition to work executed in the last two or three years such levels have been extended up to the Androscoggin and Penobscot Rivers in Maine, well toward the headwaters. These are found to be of the greatest utility in connection with studies of water power of these streams.

In New Hampshire and Vermont an area of about 250 square miles was surveyed in the neighbourhood of Hanover, chiefly in the interest of Dartmouth College, which will utilize the results in educational work. A beginning was made at the instance of the State Bureau of Forestry of New Hampshire in the survey of an area of about 500 square miles about Winnepesaukee and Squam Lakes. This map will not only be useful in connection with the study of forestry problems, but to thousands of persons who resort to this region each summer.

In Maryland co-operation was continued with State Geologist William B. Clarke, and resulted in the survey of two areas of about 250 square miles each. These consisted of more detailed topographic mapping over the earlier reconnaissance areas about Laurel and Rockville. The first is of especial interest because of its proximity to Baltimore, where good road improvements are being rapidly extended, and the second because of its proximity to Washington, the Rockville sheet bordering the Washington sheet on the north. Preliminary work was also done looking to the extension of these surveys between Washington and Frederick.

In Michigan an area of about 500 square miles was mapped in much detail in the neighbourhood of Pontiac and Rochester, while a large amount of preliminary work was done immediately west thereof. This work was executed in co-operation with, and at the request of, Dr. Alfred C. Lane, State Geologist, and will be utilized

not only in the study of economic and geologic problems, but especially in connection with studies of the old lake beaches and of the interesting morainal deposits covering a portion of this region.

Some of the most interesting topographic mapping of the past season was executed in northern Minnesota, just northeast of Crookston and northwest of Red Lake. This work was executed chiefly with the view to furnishing data upon which to study problems of draining the swamp lands, included within the area of the ceded Chippewa Indian reserve in Minnesota. This whole region is exceedingly level, the slope averaging about 1 ft. to the mile, and being quite uniform. It is covered with great areas of swamp and bog, and as it is quite open and the land an extremely rich, sandy loam, will furnish some of the best agricultural lands in the country when drained. The Red Lake, which is included within this area, is a double lake consisting of two elliptical bodies of water joined by a narrow pass. An area of about 500 square miles was covered with lines of spirit-levelling run with great accuracy, and topographic mapping was extended over a large portion of this area. Elsewhere in Minnesota preliminary work for topographic mapping was pushed with some vigour northwest of Minneapolis in Wright County and in southeastern Minnesota in Winona County.

In Mississippi an area of about 250 square miles was surveyed just south of Jackson, the results of which will be useful in connection with studies of the clay and cement materials of the State.

In Missouri a large amount of topographic mapping was executed, an area of about 400 square miles being mapped in the southwestern corner of the State just south of Joplin, the results to be utilized in the study of the extension of the mineral deposits of the Joplin district. In northeastern Missouri an area of about 250 square miles was mapped, chiefly in Macon and Shelby Counties. In addition quite an area of topographic mapping was completed in Platte County in connection with a topographic survey of the Ft. Leavenworth, Kansas, quadrangle.

A little topographic mapping of an important area was completed in northern New Jersey. This work is in the neighbourhood of Port Jervis, and is important because it practically completes the survey of the small unmapped corner of New Jersey lying in north Sussex County. A considerable amount of revision work was done in the neighbourhood of Greenwood Lake, bringing the topography of that region up to date chiefly in matters of culture.

In New York topographic work was done in co-operation with Henry Van Alstyne, State Engineer. An area of about 220 square miles was completed about Loon Lake in the Adirondacks, and an

equal area about Potsdam in St. Lawrence County. Areas of 225 square miles each were mapped near Port Jervis and Goshen, chiefly in Orange and Sullivan Counties. In addition a large amount of preliminary mapping was extended over portions of Oswego County about Cooperstown, and in Delaware and Ulster Counties about Neversink.

In eastern North Carolina co-operation was had with the State Geologist, Dr. Joseph Hyde Pratt, and S. L. Patterson, Commissioner of Agriculture. The results of the season's work included the topographic mapping of areas of about 250 square miles each in Gates and Hertford Counties, and an equal area in Johnston and Sampson Counties. In addition, a large amount of preliminary map work was extended to the neighbourhood of Clinton in Sampson County.

In North Dakota some preliminary work was executed in the extreme western edge of the sheet, near Williston. This work will be utilized in connection with the study of the important lignite deposits along the Missouri River.

The greatest amount of topographic mapping executed in any one State was in Ohio, where liberal appropriations had been made for the extension of co-operative topographic surveys under the direction of the Governor, who was immediately represented by Prof. C. E. Sherman of the State University, as State Inspector of Surveys. In all, seventeen atlas sheets of 225 square miles each were completely mapped, and an equal area of country was covered with preliminary work of road traverse, levelling, etc., the gross area mapped exceeding 3,000 square miles. This work was generally distributed through the State, and was so placed as to meet the needs of the officials for accurate map information upon which to base studies of the mineral resources and other economic problems.

In Pennsylvania a large area of topographic mapping was completed in co-operation with the State Survey Commission. This work includes the complete mapping of six atlas sheets of about 225 square miles each, and of an equal area of preliminary mapping of roads, running of levels, etc. A portion of the work was in southeastern Pennsylvania, in the neighbourhood of Harrisburg and of Gettysburg. The larger part of it was in western Pennsylvania, where problems connected with the development of coal, oil, and gas resources await solution.

In South Carolina an area of about 250 square miles was mapped in York and Cherokee Counties and in the neighbourhood of Kings Mountain, North Carolina. This work will be utilized in studies of the extension of the tin deposits known to exist in this region.

In Tennessee an area of about 250 square miles in the Cumberland Plateau, east of Murfreesboro, was surveyed. Preliminary road traverse and levels were run about Franklin in Williamson County, and Jackson and Madison County. This latter area is of especial interest because of the rapid extension of improved highways, the study of soils of the Bureau of Soils of the Department of Agriculture, and questions of drainage along the Deer Creek.

In Virginia an area of 250 square miles was mapped in detail over the old reconnaissance surveys near Natural Bridge and Buchanan. An area of equal extent was completed near Hampton and Newport News, which it is expected will be of much interest, not only in connection with the Jamestown Exposition, but chiefly for studies by the War Department of defences of the Chesapeake and the Potomac River.

In West Virginia co-operation with the State Geologist, Dr. I. C. White, resulted in an unusually large amount of completed mapping. Seven atlas sheets of 225 square miles each was surveyed in the western portion of the State. These are especially needed now in connection with the rapid development of oil, gas and coal in that region. This season's work completes the map of West Virginia, excepting an area of about 50 square miles near Berkeley Springs.

In Wisconsin two parties were maintained for the season, one in the mapping of an area of 220 square miles about Cross Plains, which is just west of Madison, and the other in Monroe County near Sparta. The results of the first area will be especially important to the State Geologist and to the University of Wisconsin, and the second in connection with studies of the development of the mineral resources of western Wisconsin.

The topographic surveys of the United States Geological Survey have been pushed forward in the west at a rate about equal to that of previous years, with the exception of the work in the areas covered by forest reservations. By agreement with the chief of the Bureau of Forestry this year, the larger portion of the sum appropriated to the survey of forest reserves was devoted to the preparation of working forest maps, and a correspondingly smaller amount of funds remained available for field surveys over unmapped areas.

The preparation of these working forest maps under the direction of the United States Geological Survey has made remarkable progress in a relatively short period of time. The maps are compiled primarily from the existing topographic maps of the Geological Survey in conjunction with the records of the land surveys. The recent results of topographic surveying, as well as the reconnaissance

work done by the old Powell, Hayden, Wheeler and King surveys, are compiled and adjusted to the land survey work in such manner as to fix as definitely as possible the relations of the topographic features to the land lines. This work is reproduced on the large scale of two inches to one mile. The results are photolithographed and distributed, through the Bureau of Forestry, to forest supervisors and rangers. By these the working maps are used in plotting the different varieties of timber and the extent of each variety, also in recording facts as to probable ownership and occupation of cleared lands, the division of cleared lands into grazing, agricultural, or barren land, the record of permits for lumbering and grazing, and other essential facts connected with forest supervision and management. All such working maps have been prepared for nearly half the total area of reserves, which aggregate in all over 100,000,000 acres, and they have been completed for a number of the larger reserves.

The feature of the topographic mapping of the past year in the west was the continuation of reconnaissance work on a scale of four miles to one inch and with elevations shown by contours of 200 ft. intervals in some of the larger unmapped portions of the United States. A year ago this work was commenced in the Amargosa Desert country, at which time about 9,000 square miles were mapped in southwestern Nevada and southeastern California. In the course of this work one atlas sheet covering a square degree was completely mapped, and portions of three others partially mapped. During the past season this work has been continued in view of the great economic importance of this region, which includes not only the borax deposits of the Desert, but such exceedingly important gold developments as those found about Bullfrog, Goldfield and Tonopah. Two thousand square miles of the area of the Las Vegas four-mile sheet, chiefly in Lincoln County, Nevada, have been mapped in this manner this year, and it is hoped that the entire sheet may be completed this season.

The same class of reconnaissance work was commenced in eastern Montana on the upland between the Missouri and Yellowstone Rivers, where little knowledge is available concerning the topography, and yet this latter is of interest in connection with projects for irrigation. A degree atlas sheet covering an area of nearly 4,000 square miles is being surveyed in eastern Dawson County, and there have been completed so far about 2,000 square miles of this area. This reconnaissance work is of a kind done in the earlier years by the old Powell and Hayden Surveys, and in the first ten years of

the present Geological Survey. Also, the same kind of work has been recently executed in some of the undeveloped parts of Alaska. The unsurveyed area of the Far West is so vast that the present progress of detailed topographic mapping precludes the securing, in entirety, of essential topographic data for many years, because of the present rate of appropriations. It has, therefore, seemed wise to fill up hastily the unknown areas, extending meanwhile more detailed mapping in those portions of the west in which important developments, such as mining, irrigation, forestry, etc., may be in actual progress.

In Montana, in addition to the reconnaissance surveying, an area of about 600 square miles has been mapped in Granite and Ravalli Counties. This is on the two-mile scale and with 100 ft. contours in the rougher and less-known portions of the Rocky Mountain region.

In South Dakota topographic surveys on a scale of one mile to one inch have been extended over an area of about 125 square miles in Butte County. This mapping has been in progress for several years in the Black Hills and north thereof, the purpose being chiefly to secure detailed maps of the areas to be irrigated by the Belle Fourche project.

In Nevada, in addition to the reconnaissance work about Las Vegas in Lincoln County, a topographic map has been made on a large scale in White Pine County, about Ely, with a view to the study of the economic resources in precious metals. This map is on a scale of 2,000 ft. to 1 inch and covers a small area of approximately 25 square miles.

In Oklahoma co-operation for topographic mapping has been begun with the State Bureau of Agriculture. As a result topographic mapping has been pushed with unusual activity in this newest of our States. Work has been in progress during the summer on nine separate atlas sheets, eight of which are on a scale of 1 mile to 1 inch, and one, in the extreme northeastern corner of the State, on the two-mile scale. On the larger scale the Agra atlas sheet has been surveyed in Payne and Lincoln Counties. The Mallon sheet, partially mapped in connection with Indian Territory surveys, has been completed; so has the Sac and Fox atlas sheet. The Shawnee quadrangle, chiefly in Lincoln County, has been completed. Some work has been done on the Prague, Romulus, Asher, and Luther quadrangles, all in Pottawatomie County.

While the topographic mapping of all the Indian Territory has now been completed, a good beginning has been made in the mapping

of the sister territory of Oklahoma, which composes about half of the new State of that name.

In Colorado the Loveland one-mile atlas sheet, and the Ft. Collins one-mile sheet, have been completed. About 500 square miles of the Livermore two-mile atlas sheet in Larimer County have been mapped. A large amount of re-survey of the old reconnaissance work on the Colorado Springs atlas sheet has been completed; also the Pikes Peak special one-mile atlas sheet with 50 ft. contours has been completed.

In Wyoming a small corner of the Medicine Bow two-mile atlas sheet, left unfinished last season, has been completed. The Fremont Peak two-mile atlas sheet, just southeast of the Yellowstone National Park, was completed, covering an area of nearly 1,000 square miles.

In New Mexico the Gallina quadrangle, chiefly in Rio Arriba County, has been more than half mapped. The scale of this work is 2,000 ft. to one inch. It lies in the higher mountains just northwest of Santa Fé.

In Washington two areas were under survey; the Zilla quadrangle, chiefly in Yakima County, on the two-mile scale, had about 500 square miles of its area mapped. In Whatcom County the Sumas quadrangle, on the one-mile scale, had about 150 square miles of its area mapped.

In Oregon topographic surveying was executed in co-operation with the State, three quadrangles being under survey, all on the two-mile scale. The Ironside Mountain quadrangle in Grant and Baker Counties was about half mapped. A small area of mapping was completed on the Mt. Hood Special in the Bull Run Reservation. In Morrow County about 600 square miles of the Wells Spring quadrangle were surveyed.

In Texas the survey of three quadrangles is under way and will be continued during the winter. The Texarkana quadrangle has been partially mapped and a good beginning has been made in the survey of the San Marcos quadrangle. Additional work in this State is expected to be taken up as the winter advances.

In Utah the Marsh Peak quadrangle, already partially mapped, this year had its survey completed. This is on the one-mile scale and lies in Uinta County.

In California a very large amount of topographic surveying was in progress because of the funds made available by co-operation with the State. Much of this work was in the Sacramento Valley in lower San Joaquin County, where it can be utilized in connection

with the work of the State Debris Commission. It will also be of great value in connection with problems for the reclamation of swamps and for irrigation. The work of the year included the mapping of Elmira, Karquinez, Clarksburg, Rio Vista and Montezuma atlas sheets, chiefly in Solano County, with small portions lying in Yolo and San Joaquin Counties. Some detailed work was done on the Yosemite Special sheet in Mariposa County. This work was on the scale of 2,000 ft. to 1 inch. In Kern and Tulare Counties the Kernville quadrangle on the two-mile scale, had its area completely mapped, covering a total of 1,000 square miles.

AN ETHNOLOGIST IN EAST GREENLAND.

Dr. W. Thalbitzer, who has recently returned from a long visit to East Greenland, where he has been studying the natives and their language, has written an account of his sojourn among them which appears in *Petermanns Mitteilungen* (No. XI, 1906). From June 1, 1905, when his wife and he sailed for Greenland, they were entirely out of touch with the rest of the world. Angmagsalik, the only inhabited place on the east coast, is visited by a ship only once a year, and this ship, with its postal service established by Denmark in 1894, makes the voyage not directly from Europe but after touching on the west Greenland coast.

Dr. Thalbitzer landed from Denmark in the Egedesminde colony on the west coast, below 69° N., and lived there for two months until the steamer *Godthaab* sailed for East Greenland on Aug. 17. His wife took with her a west Greenland Eskimo woman as a servant, the first native woman of that coast to visit the East Coast Eskimos. The weather was very stormy, but in fourteen days the vessel lay off Angmagsalik in about 65° 30′ N. The polar current, packed with ice, was between them and the coast, and seemed to be unusually wide for the time of year. On the first day they lay about 30 kilometers from the land, but the position of the ice changed every day and for eight days the vessel was from 20 to 100 kilometers off shore. A favourable opportunity was improved on the ninth day to make way through the ice to the coast.

Angmagsalik derives its name from a large fiord to the north of Cape Dan, which, in the native speech, is called Ammattalik, meaning the place of the ammattä or caplin (*mallotus villosus*). The Danish Government established a trading station here in 1894 upon

a small island. The harbour is in a little fiord surrounded by a chain of wild and partly snow-covered mountains.

The Danish official, Johann Petersen, was awaiting the newcomers. His wife and he, with their little son, are the only Europeans living on this isolated coast. Their only connection with the outer world is the annual ship, whose arrival is more or less uncertain and whose visit is only for a few days—just long enough to take on board the fox and bear skins which the Eskimos have collected. The entire district has only about 450 inhabitants.

The Angmagsalik Eskimos were discovered by the Danish naval officer, G. Holm, who spent the winter of 1883-84 among them and specially studied their characteristics. In many respects they are more highly developed than their west coast cousins and have the advantage of being still unspoiled by the whites, and therefore they are better off. They have a rich hunting district in the great fiords around Cape Dan, the Ammattalik, Sermilik and Kangerdlugsuatsiak fiords. Polar bears by the hundreds are found along this coast in winter, the drift ice being an important agency in bringing them there. The sea is rich in various kinds of seals. White and blue foxes are in considerable numbers, but there are no other mammals.

Most of the East Greenlanders are still heathen, but since 1900 two West Greenlanders have lived among them as missionaries. Dr. Thalbitzer had spent the winter of 1900-1 among the west coast natives, and studied their dialects. His visit to Angmagsalik was under the auspices of the "Commission for Geological and Geographical Investigations in Greenland," and his special task was to study the speech and the folk lore of the Angmagsalik natives. A considerable amount of this information had already been collected by Holm (*vide* Meddelelser om Grönland 1888, Vol. X). Thalbitzer has now lived among these people, visiting them in their winter houses and their summer tents, studying their intellectual range and their ways of life, and recording their traditions.

Two heathen priests (angakit) are still influential among them. Two others have been converted to Christianity and one has been baptized. Most of the natives still believe in the existence of spirits, moon gods and mermaids (who rule over the destinies of bears and seals), and in a whole world of other mythical persons and peoples. They have many amulets in their houses, wear them on their clothing and weapons and put much faith in charms and forms of incantation which, they say, have come down to them from their fathers. The old Eskimo drum songs are still everywhere heard in these fiords.

Dr. Thalbitzer collected over 150 folk and child songs, a number of remarkable magic formulas and many proverbs and tales in the native speech. He secured phonographic records of much of the linguistic material. The angakoks or priests gave him much information concerning religious and other traditions. In the course of the winter, Mrs. Thalbitzer, who is a sculptor, modelled many busts and statuettes in wax from which to produce ethnological figures for the museums. The scientific results of this journey will be published in the *Meddelelser om Grönland* during the present year.

ERICHSEN'S EAST GREENLAND EXPEDITION.

The Duke of Orleans announced early in January that he intended to send the polar exploring vessel *Belgica* to the East Greenland coast next summer to co-operate, in every way possible, with the expedition commanded by L. Mylius Erichsen. The latter left Copenhagen for East Greenland June 24, 1906, with supplies for two years. As is well known, Erichsen's purpose is, first of all, to complete the outlining of the east coast from Cape Bismarck to Independence Bay, discovered by Peary in 1892; to send a party north over the sea ice to attain the north pole, if possible; to make a sledge journey along the northern coast of Greenland in order to complete the exploration of Peary Channel, which separates the mainland from the archipelago north of it; to explore other parts of the east coast south of Cape Bismarck which are not yet satisfactorily mapped; and to study the nature and phenomena of the inland ice, and probably to cross the ice cap to the west coast about half way between the north and south ends of the island.

This long programme may, of course, be subject to many vicissitudes, but if the expedition has good fortune the close of the exploring season in 1908 will see a great deal of work accomplished and the party on their way home.

The Duke of Orleans' voyage in the *Belgica* in the summer of 1905 (*Bull. Amer. Geog. Soc.*, 1906, No. 12, pp. 721-729), along the east coast extended to the north of the 78th parallel, about 120 miles north of Cape Bismarck, but he saw only stretches of the Greenland coast, and Erichsen's survey will really begin from south of Cape Bismarck.

Perhaps no other Arctic expedition has been more carefully planned than that of Erichsen. Among the twenty-six men in his

party fourteen are persons of scientific attainment. The scientific organization of the expedition is very thorough. It includes an ethnologist and six men who have had special training in geographical surveying and cartography. Erichsen was especially desirous to have a large cartographic force, for much of his work was to be done by small parties, and he, of course, wishes that all the results should be adequately mapped. Meteorology, hydrography, zoology, ornithology, botany, and geology are also well represented. Most of the official staff were selected for their scientific attainments. The second-officer of the vessel, the three helmsmen, and the engineer have each a scientific specialty. Two physicians and an artist are also in the party. For his sledge work Erichsen took with him 100 dogs and 6 ponies; the efficiency of the latter in sledge hauling on the sea ice was demonstrated by Fiala in Franz Josef Land.

The completion of the outlining of the Greenland East Coast and of Peary Channel will supply the information necessary to ascertain the area and shape of Greenland. On the east coast Erichsen's survey work will practically begin at Shannon Island in 75° 12′ N. and extend to the northern extreme reached by Peary, a distance of nearly 500 miles. It is hoped that he will be able to add facts of value to the interesting discoveries of Eskimo remains north of Cape Bismarck. He may be able to establish the theory now prevailing that the east coast was peopled by Eskimo migrations around the north end of the island from the western shores. We know from what the Duke of Orleans's party saw that there are many deep fiords to be explored, and the labours of the Koldewey, Nathorst and Amdrup expeditions require to be connected and completed.

Erichsen is an explorer of proved capacity and thoroughness. He was the leader of the Danish Literary Expedition, and he lived with the Arctic Highlanders, as the Eskimos between Cape York and Cape Alexander are called, for ten months. He is fairly well acquainted with the whole west coast of Greenland as far north as Etah, has sledged across the Island of Disco, and has visited the inland ice in two places. Arctic authorities have much confidence in his ability, and regard the task he has assumed as the most important work connected wth Arctic lands that remains to be done. The co-operation of the expedition sent by the Duke of Orleans must effectively promote the work of the Danish party.

GEOGRAPHICAL RECORD.

AFRICA.

A Railroad to Katanga.—Mr. Robert Williams, Director of the Tanganyika Concessions, Limited, said recently in the *Matin de Bruxelles* (Oct. 29, 1906) that a railroad is building to establish quick connection between the mineral fields of Katanga and the Atlantic coast, a distance of 1,100 miles. Fifty miles of the line, starting from the Portuguese port of Lobito Bay, Angola, are already completed, and construction is in progress on the next section of 200 miles. When this work is completed, the road will have been led up through the mountains to the plateau, beyond which point scarcely any large engineering works will be necessary, as the line will run mainly along the water-parting between the Congo and the Zambezi systems, which is comparatively level and with no rivers of importance. The road, when completed, will give a route to Katanga 300 miles shorter than any other projected route from the coast.

Mr. Williams added that up to the present time about 100 sources of copper have been located in Katanga along a belt extending about 320 kilometers from northwest to southeast, almost to the frontier of Rhodesia. The amount of copper within 100 feet of the surface ready for exploitation is enormous. Tin, gold and coal have also been discovered. The resources in tin are very great, but the prospectors, as yet, have only found traces of gold. The coal discoveries are too recent to warrant any estimate of their value. The entire mining interests of the Tanganyika Concessions, Ltd., have been merged with those of a new and larger company, the Mining Union of Upper Katanga, which is also building the railroad between Lobito Bay and the Rhodesian frontier.

Captain Larras's Cartographic Work in Morocco.—Captain Larras, a member of the French Military Mission in Morocco from 1899 to 1903, surveyed a large number of itineraries in the Makhzen regions (those subject to the full control of the Sultan), where he could travel safely. At times also he imperilled his life by extending his route surveys into the lawless areas. The routes he mapped extend for over 8,500 kilometers, of which about 2,000 are in northern and over 6,000 in southern Morocco. These itineraries make a perfect network of routes covering the triangle Tangier-Rabat-Fez, in the north, and the large quadrilateral formed by the Atlantic coast and the lines Rabat-Demnat-Tarudant-Agadir. The cartographer also paid much attention to the mapping of surface forms. The surveys cover 32 large sheets on a scale of 1:1,000,000, and three other sheets on a scale of 1:500,000. They are of a high order of excellence and are comprised in the region between 7° and 13° W. Long. from Paris, and 30° and 36° N. Lat. *La Géographie* (No. 6, 1906), in an article on Captain Larras's splendid contribution to the mapping of Morocco, expresses regret that, although the writer was permitted to see the sheets during the preparation of his paper and Mr. de Flotte-Roquevaire was also allowed to refer to this valuable material in preparing the second edition of his general map of Morocco on a scale of 1:1,000,000, the Service Géographique de l'Armée treats them as secret documents.

AMERICA.

ASSOCIATION OF AMERICAN GEOGRAPHERS.—This Association held its third annual meeting at the house of the American Geographical Society on Monday, Dec. 31, 1906, and Tuesday, Jan. 1, 1907. The programme, including about fifty papers and addresses, was so long that much compression was required to adapt it to the time limit. Five sessions were held, one on Monday evening. The evening session was given to recent exploration. Mrs. Leonidas Hubbard, Jr., gave an illustrated address on her recent pioneer survey of the Naskaupie and George Rivers, Labrador; Dr. F. A. Cook described his remarkable ascent of Mount McKinley, and showed slides of the journey clear to the top of the mountain; and Mr. Alfred H. Brooks spoke briefly of his meeting with Captain Amundsen at Nome. Among the other features of the programme were the following papers and addresses, many of which were illustrated. Those which were necessarily omitted or were read only by title are not given here:

Cyrus C. Adams. Some Phases of Future Geographical Work in America. President's address, (p. 1).

W. M. Davis. Memorial of Israel Cook Russell; Place of Coastal Plains in systematic Physiography; Geography as defined by Hettner; The Eastern Slope of Mexico.

William Churchill. Insularism and the Nesiote Type.

Charles C. Adams. The Evolution of the Isle Royale (Lake Superior) Biotic Environment.

G. E. Condra. The Opening of the Indian Territory.

Isaiah Bowman. The Deserts of Peru and Chile in South American History.

E. N. Transeau. The Need of Evaporation Data in Plant Geography.

William Libbey. Problems of the Panama Canal.

E. O. Hovey. The Isthmus of Tehuantepec.

Angelo Heilprin. Guiana and Venezuela as a Field for Geographical Exploration.

W J McGee. The Prospective Conquest of the Mississippi River; The American Deserts and their Reclamation.

Alfred H. Brooks. Railway Routes in Alaska.

H. L. Bridgman. The International Polar Congress at Brussels.

G. W. Littlehales. The Nature and Purpose of the Chart-Publications of the Navy Department, and their Geographical Extent.

E. Huntington. Influence of Changes of Climate upon History.

A. L. Rotch. The Circulation and Temperature of the Atmosphere at great heights above the tropical Atlantic.

R. DeC. Ward. The Meteorology of the North and South Polar Areas.

F. P. Gulliver. The Orientation of Maps.

A. P. Brigham. Geography for College Entrance.

Collier Cobb. Hatteras Island and its Shifting Sands.

D. W. Johnson. The Texture of Topography.

H. E. Merwin. Land Forms as Plant Controls.

A successful feature of the programme was the discussion of papers. In order to increase the interest and value of these discussions, the authors had been requested to supply brief abstracts of their topics, which were printed in the preliminary programme.

The meeting closed with a dinner at the Hotel Colonial on Tuesday evening. Professor Angelo Heilprin was elected President and Prof. A. P. Brigham was re-elected Secretary and Treasurer for the ensuing year. The other officers are: First Vice-President, Prof. Ralph S. Tarr; Second Vice-President, Mr. G. W. Littlehales; Councillors, Prof. W. M. Davis, Mr. Cyrus C. Adams and Prof. J. Paul Goode. The next winter meeting will be held at Chicago in connection with the meeting there of the American Association for the Advancement of Science.

The Association of American Geographers now numbers nearly 70 members throughout the country.

Report of the Coast and Geodetic Survey.—Superintendent Tittmann's *Report* for the year ending June 30, 1906, says that the most notable feature of the year's work was the determination of longitude in Alaska along the coast and in the interior by the telegraphic method. The completion of the military cable and telegraphic lines in certain localities made this possible. The determination at Eagle is important in connection with the marking of the international boundary. The new position of Valdez is three minutes of arc (or 1½ miles) west of the position hitherto tentatively assumed. The work of tracing and marking the boundary line between Alaska and Canada and of re-marking the northwest boundary between the United States and Canada was continued. The magnetic declination, dip, and intensity were determined at 382 stations distributed over 43 States and Territories. A series of observations made on the *Bache* on her trip from Key West to Galveston and return supplied means to extend the iso-magnetic lines well into the Gulf, with almost as great accuracy as over the land. Numerous dangers to navigation were located.

Government Map Making.—We are informed that the Departments of the Interior and of Agriculture are to co-operate in preparing traverse plan maps by the Geological Survey where they may be immediately needed in connection with the work of the Bureau of Soils. The survey of the soils of the country has made rapid progress in the Department of Agriculture for two years. The bases of these maps are topographic maps. For a large part of the country, more especially in the southern States, topographic maps are not yet available, as the greater part of the topographic mapping has been completed chiefly in the mountainous regions of the east and of the Far West, where mineral resources are the principal economic product. While the topographic surveys are now widely extended in the New England and middle Atlantic States, little progress has been made along the coastal plains from Maryland to Florida and Texas and through the Mississippi Valley and central and northern plains country. The co-operation between the two Departments will enable the Bureau of soils to push forward its surveys under more satisfactory conditions.

Work of the Hydrographic Office.—The whole map issue of the Hydrographic Office at the present time comprises in round numbers 1,600 charts, of which 400 are lithographic and photo-lithographic productions and the remainder are engravings on copper and steel plates. As these charts are for the use of navigators the correct delineation of the coasts and the representation of the topographical and marine hydrographical features in the bordering regions are, of course, treated as of chief importance, while interior land features have been generally omitted. The Hydrographic Office is engaged systematically in the construction of general coast charts of the globe on a uniform scale of 4½ inches to the degree of longitude on the Equator, of special coast charts on a scale of ¼ inch to the minute of middle latitude of each chart, and of local and harbour charts of foreign countries on large scales, varying according to the available data and the characteristics of the locality from 1 to 10 inches to the nautical mile.

Maryland Geological Survey.—This Survey has just published the third volume of a series of reports dealing with the systematic geology and palæontology of Maryland. The two preceding volumes dealt with the Eocene and Miocene deposits and the remains of animal and plant life which they contain. The present volume describes the two most recent divisions of geological time, the Pliocene and Pleistocene, which have exerted a potent influence upon the surface con-

figuration and soils of Maryland. The account of these deposits is from the pen of Dr. G. B. Shattuck, while Dr. William B. Clark, A. Hollick, and F. A. Lucas interpret the palæontological data.

Dr. Shattuck's monograph shows that the superficial deposits of Maryland are the last of a long series of unconsolidated beds, which began to be deposited in Lower Cretaceous and possibly Jurassic time, and have continued with interruptions down to the present. These deposits are composed of clay, peat, sand, greensand, marl, gravel, iron ores, and ice-borne boulders. The topography of the region shows that the surface of the Coastal Plain is made up of five distinct systems of terraces, the oldest lying at the top and the others lying successively beneath in the order of their age. The fifth terrace is now being built by the waves of the Atlantic Ocean, the Chesapeake Bay, and estuaries. Like all the Maryland reports the volume is handsomely produced.

Limestone Resources. in Ohio.—The Geological Survey of Ohio has issued *Bulletins* 4 and 5, containing the results of an investigation of the limestone resources and industries of the State and of the manufacture of sand-lime brick. Comparatively little has been written about these industrial opportunities in Ohio, though the limestone quarries of the western half of the State have long afforded a field of great activity in the production of limestone and the manufacture of lime and its by-products. The limestones of the eastern part of Ohio have been neglected, the popular idea being that all were impure and dirty; but the growth of the Portland cement industry has brought about a more vigorous search to find these limestones in close proximity to fuel. This search has been productive, and in the southeastern part of the State limestones well adapted for the manufacture of Portland cement are found in close proximity to beds of coal and clay.

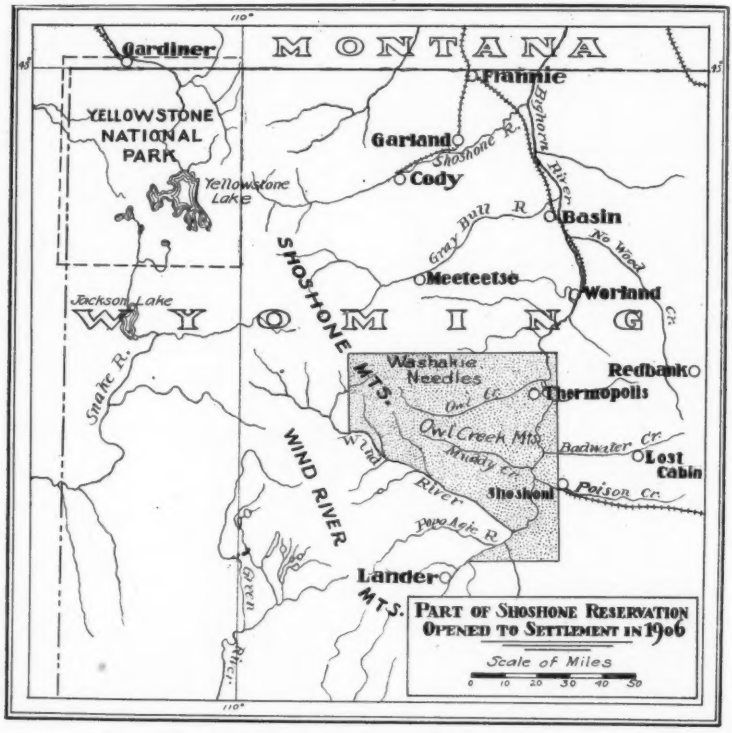
Climate of Michigan.—The climate of Michigan is briefly discussed in a recent paper by Professor M. S. W. Jefferson, entitled *Material for Geography of Michigan* (Ypsilanti, Mich., 1906). The effect of the Great Lakes in mitigating the temperatures during a very hot spell, August 24, 1904, is shown diagrammatically, the cooling being noticed along the shores. The point is well made that Michigan is not, therefore, cooler in the mean than places east and west of it. A chart showing the distribution of minimum temperatures on the morning of January 24, 1904, clearly brings out the fact that the warming effect of the lake waters moderates the extremes of cold in the shore counties. A map of mean annual rainfall (1880-1904) shows some interesting patches of increased rainfall on every distinct elevation that stands to the southeast of one of the lakes.

R. DeC. W.

Opening of the Shoshone Indian Reservation, Wyoming, to Settlement.—About a year and a half ago, the Shoshone and Arapahoe tribes belonging to the Shoshone or Wind River Reservation in Wyoming ceded to the United States a portion of their reserve. The President of the United States on June 2 last made known by proclamation that all the unallotted lands in the ceded portion would be open to settlement on and after Aug. 15. As it was felt that many people throughout the country would be interested in the opening of these lands and desirous of knowing something about them, the Senate directed the Secretary of the Interior, last winter, to supply such information relating to the geology and natural resources of that region as might be in possession of the Geological Survey.

The results of the reconnaissance, made by N. H. Darton of the U. S. Geological Survey during the summer of 1905 have therefore been printed as Document No. 219 of the 59th Congress. The pamphlet is illustrated with maps and many photographs. Our map shows the entire area studied by the geologist and his assistants. The portion of the reservation that has been opened to settlement is that lying between the Wind River on the south, the Big Horn River on the east, Owl Creek on the north, and the eastern part of the Shoshone Mountains on the west.

The Wind and Big Horn rivers carry a large volume of water and flow in flat-bottomed valleys along which there is a moderate acreage of land that is



immediately valuable for agriculture. With a mean average rainfall of about 13 inches a year, the climate is too arid for the raising of crops without irrigation; but, by the construction of irrigation canals, wide areas of the basin lands may be brought under cultivation, especially if the flood waters of the mountain slopes are stored for use during the dry season. The greater part of the region is well adapted for grazing; and this, undoubtedly, will be its principal use. Fully two-thirds of the land is covered with a fair growth of nutritious grasses and water for stock is within reach, excepting in a few districts. Coal deposits in the centre of the area will afford a useful local supply.

BOGOSLOF ISLANDS.—President David Starr Jordan and Mr. Clark have an interesting, illustrated article on these islands in the December number of the Popular Science Monthly. Prior to 1796, there existed in the neighbourhood of Bogoslof Islands an isolated pillar of rock known as Ship or Sail Rock, which was mistaken for a ship under sail by Captain Cook in 1778. This rock was finally destroyed by the waves about 1888. In 1796 a volcano arose near this rock to which the name Bogoslof was given, this name being the Russian for Saint John, the Theologian.* The description of the formation of the birth and growth of this volcano has been handed down to us by Kotzebue from the story of a Russian trader.

In September, 1883, a new volcano appeared near this to which the name "New Bogoslof" has been given. Its birth was accompanied by the emission of great volumes of steam and showers of ashes. When visited in 1890 by Dr. Gilbert, there were two small islands a mile and a half apart, one of them steaming, the other, Old Bogoslof, already cooled off. On May 28th, 1906, when G. K. Gilbert again visited the region, he was astonished to find that the New Bogoslof, or Fire Island, was no longer smoking, but that a third very large island had arisen half way between the old and new islands.

This new volcano, which arose in April, 1906, has led Dr. Jordan to ask whether there might not be some possible connection between its formation and the San Francisco earthquake. But after consideration of the question he has dismissed it as improbable; and most geologists will agree in this conclusion.

R. S. T.

A LAND LAW FOR ALASKA INDIANS.—Dr. Sheldon Jackson recently called the attention of the Lake Mohonk conference (Proceedings, 1906) to the fact that Congress, last winter, passed a law giving the native population of Alaska an opportunity to secure title to land. He said that heretofore, wherever the white man desired a good plot of clear ground that an Alaskan native's ancestors had cleared and occupied, he simply took it, and the natives had no redress. Congress has now given an opportunity for them to secure a Government title to a tract of land that will fully protect their rights in it.

TREES ON RAILROAD LINES.—The Canadian Pacific Railway Co. has begun tree planting on quite an extensive scale along its Western lines. A contract has been let for a small acreage of breaking near Wolseley, on which it is the intention to experiment with tamarack for ties. A piece of ground is also to be planted at Medicine Hat with Jack pine and tamarack for the same purpose. Over 100 miles of trees are to be planted between Winnipeg and Calgary for snow breaks, and at several stations trees are to be planted around the station grounds, and prizes are to be offered the section foremen who make the best showing. The work, if carried on successfully, ought to encourage tree planting among the farmers of the West.—*Forestry Quarterly*, No. 4, 1906.

MAGNETIC SURVEY OF MEXICO.—A magnetic survey of Mexico is now in progress under the joint auspices of the Mexican Government and the Department of Terrestrial Magnetism of the Carnegie Institution of Washington. The Mexican Government has two parties in the field under the direction of the Observatorio Astronómico Nacional Mexicano, Engineer Señor Abel Dias Covarrubias having charge of the eastern party and Señor Manuel Moreno y Anda being in charge of the western party, embracing the Pacific Coast from Manzanillo to

* In the Russian calendar the 8th of May is the day of Saint John Bogoslof.

Guaymas, inclusive of Lower California. The Carnegie Institution Observer, Mr. J. P. Ault, will confine his operations to the part of Mexico north of the 25th parallel, upon the completion of which he will then proceed to Campeche, Yucatan, and the Central American countries.

The early completion of the general magnetic survey of Mexico being thus assured, it will be possible within the next year to construct magnetic maps for the region between the parallels of latitude 20° and 49° and meridians of longitude 65° and 125° West of Greenwich.

Climatology of Colombia.—As evidence of the increasing attention which the South American republics are now attracting, we have more and more numerous publications, both in the form of books and of articles, on these countries. A recent book on Colombia (*The Republic of Colombia,* by F. Loraine Petre, London, Stanford, 1906), commenting on the three mountain ranges of the country, calls attention to the fact that on the central range the snow-line is at 15,000; the limit of forest growth at 10,000 ft., "and between these limits exists the *Páramo,* or cold desert, a region beyond description, almost without vegetation, always covered by a cold, dense fog, and in many places swampy." These *páramos* occupy the summits of the western range of mountains, and also all the passes of the central range, and constitute an important hindrance to travel. The "perpetual spring" climate of Bogotá is, as usual, accorded high praise, although the monotony of such uniform conditions is surely not ideal for one used to the variety of meteorological phenomena and changes of the north temperate zone. Tropical diseases, like yellow fever and malaria, are unknown at Bogotá, and "tuberculosis has no abiding habitation among the natives." Advanced cases of tuberculosis are reported as being cured in a remarkable way.

R. DeC. W.

The Climate in the Amazon Basin.—A study of the climate of the Amazon basin region, and especially of the lower Amazon, by Paul LeCointe (*Ann. de Geogr.,* XV, Nov. 15, 1906), brings out many interesting facts concerning the meteorological conditions of a district of which comparatively little is known as yet. The writer, who has lived in the country continuously for fourteen years, has endeavoured to give an impartial opinion concerning the climate, especially in relation to European settlement, pointing out that the most exaggerated statements have found their way into print as to the favourable and also as to the injurious effects of the climate upon the white race. The temperatures are characteristically high and very uniform, the maxima occurring in the lower Amazon basin, but nowhere exceeding a mean annual of 81.5°. The well-known fact that high maxima are recorded in the arid regions of the tropics, at greater distances from the equator, is noted. The natural division of the year is not according to temperature, because the variations are small, but according to rainfall. Rainfall is heavy over the whole area, *i. e.,* the number of rainy days is large, but downpours of the Bengal type, or such as occur on the west coast of Africa, are stated to be unknown. There are no severe droughts, such as those occasionally noted in other adjacent parts of northern Brazil. The northeast trades, coming over a large extent of warm ocean water, carry an enormous quantity of water vapour across the whole South American continent up to the western Cordilleran barrier. The rainfall régime, as has long been known, is not as simple as is found, for example, in parts of equatorial Africa. On the north bank of the Amazon estuary, at Macapa, the rainy season is sharply

separated from the dry season, the former lasting eight months and the latter four months. This same régime is found at many other places. On ascending the Amazon, especially on the left bank, the two seasons are very distinct as far as the Rio Purús, but the duration of the rains decreases, and occasional heavy downpours interrupt the dry season. At Pebas the rains last almost all through the year. On the eastern base of the Cordillera the moisture brought by the trades is condensed into almost incessant rains or snows, while across the mountains, on the west coast, there is extreme aridity. Dew forms in such large amounts in the interior that it actually falls as rain from the tree tops—a curious phenomenon, first reported for this region, we believe, by Humboldt. Cyclones are unknown, and the reported occurrence of "tornado" we should question. It was probably a straight-line gale. Floods covering an immense extent of country, and forcing men and domestic animals to seek the upper parts of dwellings or to live for a time in boats, occur with regularity. An interesting compensation of rainy seasons along the tributaries on the two sides of the Amazon keeps up high water in the main river. When the water supply from the tributaries on the right bank decreases, the tributaries on the left bank bring in their high water supply, the difference in season depending on the migration of the doldrum belts of equatorial rains. A hot summer in the Cordilleras means rapid melting of the snows there, and high water in the streams supplied from that district. The general summary of the climate is as follows: Frequent and abundant rains, but not downpours; high humidity nearly reaching saturation over most of that part of the basin which is covered with forests; periodic inundation of the lowlands; the heat not excessive, but constant, in part compensated by good ventilation. The periodic overflows make it impossible to use for agriculture much of the low-lying alluvial land.

Malaria is the principal barrier in the way of exploration and settlement by white men in the interior, and occurs in places with apparent disregard of the presence or absence of the *anopheles* mosquito. Yellow fever, beri-beri and leprosy are also common. At Belen yellow fever is a real danger to the new arrival, but hardly ever attacks the native or an acclimated individual. Beriberi is found in the upper part of the valley, above Manaos. As elsewhere in the tropics, all the endemic diseases are due more to the neglect of proper sanitary precautions than to the climate. The writer believes that for the European colonist who chooses a suitable dwelling-place, and who lives temperately, the climate of the lower Amazon is perfectly bearable. Great care of the health must, however, be taken at all times, especially during any journey into the interior; during the beginning of the rainy season, and during the fall of the flood waters. The best places for settlement are the higher portions of the basin.

R. DEC. W

THE GUAYAQUIL AND QUITO RAILWAY.—This is the railway which ascends from the sea at Guayaquil the western slopes of the Ecuadorian Andes, and is now being extended along the high plateau to Quito, the capital. Mr. Archer Harman, President of the railway, in an official statement issued Oct. 25, 1906, says that of the entire length of the railway from Guayaquil to Quito—namely, 286 miles—the line has been completed for 190 miles, including the whole of the mountain division which crosses the lower east slope of Chimborazo at a height of 11,800 feet, and is in operation as far as Mocha in the Ambato valley. Of the remaining 96 miles (the plateau division), the grading and masonry are completed to Quito, and rails are being laid at the rate of 4,000 to 5,000 feet per day.

Rails, ties, bridges, and all the material necessary to complete the line to Quito are on hand and the physical condition of the line and equipment are excellent.

SEISMOLOGICAL RESEARCH IN AMERICA.—Recently, in a brief note in the Popular Science Monthly (Sept., 1906), Professor W. H. Hobbs calls attention to the fact that America is distinctly behind Europe and Japan in provision for the study of earthquake phenomena. This fact was plainly brought out by the meagre accounts of the California earthquake from stations in the United States. That such a study is of high importance is generally admitted. Dr. Hobbs makes appeal for provision in the territory of the United States, including the outlying colonies and protectorates, for careful comparative study of future earthquake shocks. He wisely suggests that a central station should first be established in which the experiences of European observers should be made use of; and he further suggests that this first station should, for a time at least, be under the superintendence of some one of the thoroughly trained men available in Europe. It is his idea that this central station should be of the same grade as the Imperial German Chief Station for Earthquake Investigation at Strassburg.

In direct association with this main station he advocates that secondary stations should be established throughout the territory over which the United States have direct or indirect control. Owing to the wide extent of such territory, a system of stations such as he proposes could not help being of the highest importance.

Dr. Hobbs urges that the American Association for the Advancement of Science follow the example of the British Association in the appointment of "a committee to watch over the interests of seismological research in America and to direct the course of legislation in accordance with its teachings." R. S. T.

ASIA.

DR. STEIN'S RETURN FROM CHINESE TURKESTAN.—Dr. Stein reports in a letter to the London *Times* his return from his second series of explorations in Chinese Turkestan. On this journey, as earlier, he combined careful surveys of the Chinese-Indian frontier with archæological work. His former surveys of the farther side of the Kuen-lun have been largely supplemented and he has explored more ancient sites, revisiting also the Rawak Stupa, from which, on his first visit, he obtained such important archæological material. He had secured more ancient documents and his whole work will be very valuable as a sequel to his first investigation.

ECONOMIC GEOGRAPHY OF UPPER BURMA AND THE NORTHERN SHAN STATES.—A study on this topic fills about 100 pages of the *Jahresbericht* of the Zürich Geographical-Ethnographical Society. The monograph is by Dr. Hans J. Wehrli, who prefaces his economic description with a thorough geographical account of the region. A bibliography concludes the paper. The contents are largely derived from Dr. Wehrli's own studies in Burma.

EXPLORATIONS IN THE INTERIOR OF THE MALAY PENINSULA.—Messrs. Nelson Annandale and Herbert C. Robinson made an expedition in 1901-1902 to Perak and the Siamese Malay States, under the auspices of the Universities of Edinburg and Liverpool, with anthropological and zoological studies as their chief object. The Society has received the results of their work in a number of reports printed under the title of "Fasciculi Malayenses" (published for the University Press of Liverpool). Their travels were in the almost unknown interior from

Selangor to beyond the frontier of Siam and their anthropological studies related chiefly to the Sakais and the Semangs, the latter and more northern people having had no intercourse with the white race and mixing very little with other tribes. They are negritoid and of fairly pure stock, most of them inhabiting the plains, while the more southerly Sakais are hill men. The studies of these explorers and the later work of Mr. A. Grubauer among the Semangs (*Pet. Mitt.*, 1905, Nos. 11 and 12) throw clear light upon a distinct type of the jungle folk of the Malay Peninsula.

The geographical part of the work is contained in a supplement in which the explorers describe the places they visited, with a number of good photographs and an excellent map by Bartholomew. They note one fact of great geographical interest:

> We were able, however, to verify one important geographical fact bearing on the question of the high level fauna of the peninsula, which differs so completely, at any rate as far as the birds are concerned, from the fauna of the plains. There is a very distinct break in the main range in central Kedah, for in crossing from Senggora we neither ascended higher than a few hundred feet above sea-level, nor did we see a single high mountain in the vicinity of the track. This fact is interesting, because it has frequently been taken for granted that the mountain fauna of Perak, which is not found much below 3,000 feet, has a continuous distribution with that of the mountains of northern India, to which it is so nearly related; whereas it is evident, in the light of this observation, that no such exact relationship can exist at the present day . . . the Malay Peninsula, as our whole collection has served to confirm, is connected with India, as regards zoo-geography, in a degree not much more intimate than that which links it to Borneo, though many mainland forms peculiar to the plains have made their way south across the isthmus of Kra.

EUROPE.

The German and Austrian Alpine Union.—The *Zeitschrift* des Deutschen und Osterreichischen Alpenvereins for 1906 appears in its usual sumptuous form with a large variety of mountaineering papers, illustrated with maps and very beautiful photographs. The volume contains nearly 400 pages, and over 100 illustrations, including a remarkable panorama by Dr. G. Merzbacher of the central portion of the Tian Shan. Among the topics, Dr. Merzbacher treats of the Tian Shan ranges; Dr. Bertram of high climbing in the Central Pyrenees; Mr. Hans Pfann of two journeys without guides in the group of Mont Blanc; Prof. G. Steinmann of geological problems in the Alps; Mr. Henry Hoek of mountain climbing in Bolivia, and Mr. E. W. Bredt of the development of Alpine art. Tourists in most parts of the Alps are now constantly reminded by comfortable shelter houses, well-built paths, and guide-posts everywhere, of the debt that Alpine travellers owe to this Union, whose energy has supplied so many conveniences.

Marine Fisheries of Northern Europe.—The Permanent International Council for the Exploration of the Sea has just issued in Copenhagen the first volume of the "Bulletin Statistique des Pêches Maritimes des Pays du Nord de l'Europe," covering the years 1903 and 1904. As full an account of the sea fisheries in the countries of north Europe is given as the available information permits. Both the English and German common names of species of fish are given. The quantities of the various species are expressed in terms of weight, the kilogram being taken as a unit. Statistics for over 30 species of fish and for each country are tabulated and a series of charts shows the herring fisheries for every month, conventional signs making it possible to calculate the total quantities of herring taken at or near the position marked, to within about 125,000 pounds of the actual quantities.

VESUVIUS DURING THE EARLY MIDDLE AGES.*—Under this title Dr. Chas. R. Eastman discusses the question of the probable early condition of Vesuvius, basing his discussion upon the descriptions which have been handed down to us, and accompanying his paper by a reproduction of some of the earlier views. It has been customary to consider the form of Vesuvius before the eruption of 79 A. D. to have been that of a fairly regular cone, capped by a large crater or caldera. Eastman challenges this interpretation, and in support of his position shows that illustrations of the Volcano during the Middle Ages clearly prove the presence of the older crater or Somma rim somewhat like that of the present. He also reproduces a Pompeian fresco in which the ancient Somma rim is represented, indicating quite clearly that the old crater rim was present even before the destruction of Pompeii, and that its origin antedated the great historic outbreak of 79. R. S. T.

THE ERUPTION OF VESUVIUS IN 1906.—During the recent (April, 1906) eruption of Vesuvius an American geologist, Prof. W. H. Hobbs, who was then in Italy, found opportunity to examine some of the phenomena associated with it. His observations have recently been published,† with a number of illustrations. This eruption, the greatest since 1631, has been so fully described in numerous papers that no attempt will be made to repeat these descriptions. Two points in Dr. Hobbs' paper, however, stand out prominently. One is the fact that the windows in houses were in some cases broken on the side away from the volcano. Hobbs interprets this as the result of in-moving air currents toward the ascending column of steam rising from the volcano. This in-drift, he infers, so deflected the path of projectiles that they moved not only downward but inward, toward the cone.

A second point relates to a possible association of volcanoes with earthquakes. Milne has shown that the West Indian earthquakes have been related, in a broad way, to the greater eruptions of the volcanoes there; and Suess has shown that the greatest of the Calabrian earthquakes, that of 1783, followed upon grand eruptions of both Vulcano and Etna. Hobbs points out that the newest eruption of Vesuvius, the greatest since 1631, followed close upon the greatest near-by earthquake that has occurred in more than a century, and that the great earthquake of about a century ago occurred not long after the important Vesuvius eruption of 1794.

Thus Hobbs concludes that "while there is apparent lack of quick sympathetic response of one phenomenon to the other, evidence is not wanting that the influence of the one *slowly* makes itself felt upon the other." R. S. T.

VARIOUS.

THE FRANCO-AMERICAN EXPEDITION TO EXPLORE THE ATMOSPHERE IN THE TROPICS.—Dr. A. Lawrence Rotch has published a paper on the results of this expedition in the *Proceedings* of the American Academy of Arts and Sciences (Dec., 1906). Mr. Teisserenc de Bort, the well-known French meteorologist, participated in the enterprise by placing the steam yacht *Otaria* at the service of Mr. Rotch. Messrs. Maurice and Clayton, the scientific staff, sailed during the months of July and August, 1905, from the Mediterranean, *via* Madeira, the Canary and Cape Verde Islands, to latitude 10° N. long. 30° W., returning

* Popular Science Monthly, Vol. LXIX, Dec.. 1906, pp. 558–566.
† Journal of Geology, Vol. 14, 1906, pp. 636–655.

via the Azores to Havre. Seventeen kite flights were made over the ocean, and continuous records of barometric pressure, air temperature, relative humidity, and wind velocity were obtained from sea-level up to the extreme height of 2,200 meters, although wind velocity was recorded to an altitude of 3,100 meters. The direction of the wind was obtained by measuring the azimuth of the kites.

To attain a greater height in the free air than was possible with kites the *Otaria* was provided with large paper balloons, 11 of which, filled with hydrogen gas, were liberated from the Azores, Madeira, Canary and Cape Verde islands, and it was found possible to follow some of the balloons with a telescope till they reached a height of 11,000 or 12,000 meters.

A series of tables gives the results of these meteorological investigations, in respect of temperature, relative humidity, wind direction, and velocity, for various altitudes. The conditions at heights above the surface trade-winds were deduced by Mr. Clayton as follows:

> Above the surface trade is a current, some 2,000 meters in depth, varying in direction between northeast and northwest. . . . This current is extremely dry and potentially warm, and its velocity usually much exceeds that of the lower wind. The third stratum, which begins at a height of about 3,000 meters, moves from east, south, or southwest, being generally from the east in equatorial regions and from the south between latitudes 15° and 30° N. . . . As observed on the Peak of Teneriffe this stratum was dry in its lower portions, but with a larger vapor content than the air immediately below. Alto-cumulus and alto-stratus clouds were seen floating in it at a height of perhaps 4,000 or 5,000 meters, and from them light sprinkles of rain fell occasionally. . . . It is seen that the upper anti-trade is shown both by the balloons and by the drift of the clouds, the stratified conditions giving place to the southerly wind between 3,000 and 4,000 meters. Therefore the classic observations of the return-trade which were long ago made on the Peak of Teneriffe indicate a general phenomenon, and agree with those obtained over the open ocean by the present expedition.

THE FIFTEENTH BIBLIOGRAPHY OF THE ANNALES DE GÉOGRAPHIE.—The Bibliographie Géographique Annuelle for 1905 contains 1066 titles, including the best and most authoritative contributions to geography during the year under review. This annual volume is of special value to every geographical worker, because, although it by no means covers the entire range of geographical literature, the titles are selected with special view to their authoritative nature and helpfulness. It brings the literature down to recent date, and very many of the titles are accompanied with informing notes showing the nature of their contents and their distinctive value. Fifteen pages are given to the United States, and the publications of the Government Departments are fully represented. The regional distribution of the contents, together with the index of authors, facilitates reference to every title.

THE GOLD MEDAL offered by the National Geographic Society, Washington, for extraordinary achievements, was presented to Commander Peary by the President of the United States at a banquet on Dec. 15.

THE GEOGRAPHICAL SOCIETY OF VIENNA celebrated the fiftieth Anniversary of its foundation at a meeting held on Dec. 15 under the presidency of the Archduke Rainer, Patron of the Society.

RECENT ADVANCES IN WIRELESS TELEGRAPHY.—In a recent address before the Royal Institution of Great Britain (Proceedings, Vol. XVIII, Part 1), Dr. Marconi said that over 80 British and 30 Italian warships are now equipped with his apparatus. Those which are fitted with long-distance apparatus are able to keep in touch with England when far out in the Atlantic, at Gilbraltar and in the Mediterranean. Admiral Lord Charles Beresford authorized the speaker

to say that during the last cruise of the Channel Fleet from Gibraltar to England they had no difficulty whatever in receiving messages from Cornwall during the entire voyage. Seventy liners belonging to England, Italy, France, Germany, Holland, Belgium and the United States are fitted with the apparatus. On a recent occasion at Glasgow University Lord Kelvin said that he not merely believed that messages could be transmitted across the Atlantic, but that some day it would be possible to send messages to the other side of the globe.

The Annual Meeting of the American Geographical Society was held at Mendelssohn Hall, No. 119 West Fortieth Street, on Tuesday, January 22, 1907, at 8.30 o'clock, P. M.

Mr. John Greenough in the chair.

The following persons, recommended by the Council, were elected Fellows:

Max Fleischman.	Anthony Fiala.
Charles A. Peabody.	Henry W. Carey.
Frederick W. Wunderlich.	Robert B. Van Cortlandt.

The Annual Report of the Council was presented and read:

January 17, 1907.

To the American Geographical Society:—

The Council respectfully submit the following report for the year 1906:

The number of Fellows on the 1st of January was 1,355. The additions during the year were 161. The losses by death, resignation, etc., were 113 and the total Fellowship on the 31st of December was 1,403, of which number 374 were Life Fellows.

The additions to the Library number 5,098: Periodicals and Pamphlets, 3,515; Books, 633; Maps and Charts, 925; Atlases, 25.

Seven Regular Meetings of the Society were held:

On the 5th of January Dr. Otto Nordenskjöld of the Swedish Antarctic Expedition described the experiences of Two Years in the Ice of the South Pole;

On the 30th of January Mr. Poultney Bigelow addressed the Society on An American Panama—Some personal Notes on Tropical Colonisation as affected by Geographical and Political Conditions;

On the 20th of February Mr. William M. Davis addressed the Society on Experiences with the British Association in South Africa;

On the 20th of March Mr. Albert Perry Brigham read a paper on the Fiords of Norway.

On the 17th of April Mr. Howard W. Du Bois addressed the Society on a Mining Engineer's Reconnaissance in the Canadian Rocky Mountains;

On the 20th of November Mr. Richard Arthur described a Yacht Voyage of 10,000 Miles: Round the West Indies and up the Amazon;

On the 18th of December President Peary addressed the Society on the Field Work of the Peary Arctic Club, 1905 to 1906.

On the 15th of November the following awards were made:

To Dr. Robert Bell the Cullum Geographical Medal, for Fifty Years' Exploration in the Dominion of Canada; and to Dr. Thorvald Thoroddsen the

Charles P. Daly Medal, for Geographical and Geological Work in Iceland and his History of Icelandic Geography.

There have been published in the Bulletin, besides the Record, the Scientific Notes and the Book Reviews, twenty-five original papers, and the Bulletin for February was principally devoted to the transactions of the Association of American Geographers at their second annual meeting held in the Society's house on the 26th and 27th of December, 1905.

The Association of American Geographers was offered and accepted the use of the Society's rooms for the Association's third annual meeting on the 31st of December and the following day.

For the condition of the finances reference is respectfully made to the report of the Treasurer, herewith presented.

All of which is respectfully submitted.

JOHN GREENOUGH, *Chairman.*

LEVI HOLBROOK, *Secretary.*

The Report of the Treasurer was then read:

Report of the Treasurer to the American Geographical Society for the year 1906:

GENERAL ACCOUNT.

The Treasurer respectfully reports:

On January 1, 1906, there was on hand a cash balance of		$3,492.62
During the year there have been received for Fellowship Dues, Sales of Publications, Interest on Investments, etc		$20,996.20
		$24,488.82
There have been expended for Salaries, Meetings, Library, Publications, House Expenses, Insurance, Postage, etc	$21,076.31	
Exploration Fund	1,090.81	$22,167.12
Balance on hand Dec. 31		$2,321.70
Mortgages purchased		$4,650.00

Respectfully submitted,

HENRY PARISH, JR., *Treasurer.*

The Chairman announced that President Peary had found it necessary to resign the office of President, and the Council considered it most fortunate that Mr. Archer M. Huntington had consented to be nominated for that office. Mr. Peary takes with him in retiring the high regard of the Society and the warmest wishes of his associates in the Council for his success in all his enterprises.

The report of the Committee charged with the duty of selecting candidates for the offices to be filled was then read:

NEW YORK, January 17, 1907.

To the Council of the American Geographical Society:

The Committee appointed to recommend to the Society suitable persons to be elected in January, 1907, to fill vacancies then existing in its offices, respectfully

report that they recommend the election of the following-named persons to the offices designated:

		TERM TO EXPIRE IN
President	ARCHER M. HUNTINGTON	1908
Vice-Presidents	D. O. MILLS	1910
	GEORGE S. BOWDOIN	1909
Treasurer	HENRY PARISH, JR.	1908
Domestic Corresponding Secretary	JOHN GREENOUGH	1908
Recording Secretary	ANTON A. RAVEN	1910
Councillors	JAMES D. HAGUE, LEVI HOLBROOK, MORRIS K. JESUP, GUSTAV E. KISSEL	1910

JOHN GREENOUGH
A. A. RAVEN
A. D. RUSSELL } *Committee.*

The above recommendations have been approved by the Council.

The Chairman asked the pleasure of the Society with regard to the Report. It was moved and seconded that Mr. Cyrus C. Adams be authorized to cast the vote of the Society for the persons named; it was so done, and they were declared duly elected.

The Chairman then left the platform and returned with Mr. Huntington, who was heartily received by the Society. The President expressed his deep sense of the honour conferred upon him by his election, and took his place as presiding officer. He then introduced the speaker of the evening, Mr. Howard W. Du Bois, who addressed the Society on the Grand Cañon of the Colorado. Stereopticon views were shown.

On motion, the Society adjourned.

NEW MAPS.

AFRICA.

CAPE OF GOOD HOPE.—Geological Maps accompanying the Tenth Annual Report of the Geological Commission for 1905. Various scales. Department of Agriculture, Cape Town, 1906.

Five black-and-white maps showing the distribution of the geological formations in the George, Knysna, Humansdorp, and Uniondale divisions of the Coastal Plateau, Indwe Mining Area, and parts of Mafeking and Vryburg, Hay, Uitenhace, and Alexandria. A larger area than usual was mapped in 1905.

EGYPT.—Bartholomew's Tourist's Map of Egypt and the lower Nile. Scale, 1:1,000,000, or 15.8 statute miles to an inch. The Edinburgh Geographical Institute, Edinburgh, 1906 (2s. net).

The recent survey sheets issued by the Egyptian Government have been fully utilized in the preparation of this fine map. All villages and points of historic

or other interest are shown. The places between Cairo and Assuan, at which tourist steamers call, are indicated and the Nile and bordering lands are shown from the Mediterranean to Wady Halfa. An inset of Cairo and the surrounding country is given on a scale of 1:150,000, or 2.38 statute miles to an inch.

GERMAN EAST AFRICA.—Karte des südlichen Teiles der Nguru-Berge. Scale, 1:150,000, or 2.38 statute miles to an inch. *Mitt. v. Forschungsr. u. Gel. aus den Deutsch. Schutzgeb.* Vol. 19, No. 4, Berlin, 1906.

Another fine example of the surveys in progress in the German colonies. The sheet is based upon the surveys made in 1904-05 by District Commander Spieth, with additional material including the surveys of six earlier explorers. The orientation is based upon Spieth's determination of a number of latitudes and longitudes and the topography, in part, upon his observations for the altitude of fifty positions. His routes were surveyed by chain and compass with much care and detail. He constructed his route map on a scale of 1:50,000.

RED SEA TO THE ATLANTIC.—De la Mer Rouge à l'Atlantique (three sheets). Scale, 1:2000,000, or 31.56 statute miles to an inch. Mission Scientifique du Bourg de Bozas, F. R. de Rudeval, Paris, 1906.

These sheets illustrate the sumptuous volume "Mission Scientifique du Bourg de Bozas," which describes a journey across central Africa, Oct., 1900-May, 1903. The map of the route and contiguous country embraces a zone from Jibuti on the Gulf of Aden to Bumba on the Congo. The route survey was based upon points astronomically fixed by Mr. Golliez. The scale is large enough for much detailed information. As a considerable part of the zone traversed had not previously been visited, the map gives many new facts. It is admirably produced.

SAHARA.—De Tombouctou à Taodéni. Scale, 1:2,000,000, or 31.56 statute miles to an inch. *La Géog.*, Vol. 14, No. 6, Paris, 1906.

The itinerary surveyed by Lieut. Cortier, who led a company of Meharists or fleet camel cavalry, nearly six degrees of latitude north of Timbuktu, where he met Meharists from Algeria. The map illustrates Cortier's account of the journey, shows the dunes, wells, and pasturage, and gives other information for detailed mapping.

TOGO.—Karte von Togo. (D. 2. Atakpame.) Scale, 1:200,000, or 3.1 statute miles to an inch. *Mitt. v. Forsch. u. Gel. aus den Deutsch. Schutzg.*, Vol. 19, No. 4, Berlin, 1906.

Another sheet of the excellent map on this scale of Togo to which the BULLETIN has heretofore referred. Much of the eastern part of the sheet is white, as the survey has not yet been extended over it. The western half contains a large amount of information very clearly expressed.

AMERICA.

U. S. GEOLOGICAL SURVEY MAPS.

UNITED STATES.—Geologic Map of Arkansas Valley in Southeastern Colorado. Scale, 6 statute miles to an inch. By N. H. Darton. Professional paper No. 52, U. S. Geol. Sur., Washington, D. C., 1906.

ALSO IN PROFESSIONAL PAPER NO. 52.—Preliminary Map of Artesian Conditions in the Arkansas Valley in Southeastern Colorado. Scale, 6 statute miles to an inch. By N. H. Darton.

The geologic map shows the distribution of the formations on the surface. The map of artesian conditions shows the depth of the water-bearing horizon (Dakota sandstone), the area in which flows are expected, the head of the underground waters, flowing and non-flowing wells, unsuccessful deep borings, depths of wells, etc. The sandstones receive their waters from rainfall and from the sinking of streams along the foothills of the Rocky Mountains and on some of the higher slopes south of the Arkansas Valley. In the passage of this sandstone underground, the waters which it contains are held down by the overlying shales, but, as some of the sandstone outcrops are at relatively low levels to the east, only a moderate head or pressure is sustained. On account of this low head artesian flows are available only in the lower lands. This area includes nearly all of the lower lands near the Arkansas River and along some of the confluent valleys, especially to the west.

UNITED STATES.—Reconnaissance Map of the Yukon-Tanana Region, Alaska. (Circle Quadrangle.) Scale, 1:250,000, or 3.95 statute miles to an inch. Bulletin 295.

The map is bounded by the 142nd and 146th meridians, and the 64th and 66th parallels and includes about 17,000 square miles. The divergence between the true north, as indicated on the map, and the magnetic north, as indicated by the compass needle, is great (34° 25′ at Circle in 1902). Mr. L. M. Prindle, who writes the accompanying description, emphasizes the fact that this condition should be borne in mind in using the map in connection with a compass. The contour interval is 200 feet. The most prominent topographical features revealed are the numerous ridges, the Yukon Flats in the north, the absence of a well-defined divide between the Yukon and Tanana, and the great irregularity of the courses of the minor streams before they become identified with their respective drainage systems.

UNITED STATES.—Reconnaissance Map of the Salton Sink, California. Scale, 1:500,000, or 7.8 statute miles to an inch. A special sheet issued by the Geological Survey in view of the floods from the Colorado River which inundated the Imperial Valley and other parts of the Salton Sink. The contour interval is 50 feet, but elevations and topography in Mexico are only approximate.

U. S. HYDROGRAPHIC OFFICE CHARTS.

Pilot Chart of the North Atlantic Ocean, January, 1907.
Pilot Chart of the North Pacific Ocean, Feb., 1907.

UNITED STATES.—Map Showing the Distribution of the Pliocene and Pleistocene formations of Maryland. Scale, 1:500,000, or 7.8 statute miles to an inch. By George Burbank Shattuck. Maryland Geological Survey, Vol. 3 of Reports on Systematic Geology and Paleontology of Maryland. Baltimore, 1906.

A well-produced map showing, in colours, the Pliocene and Pleistocene formations and marking the location of fossils. These formations extend in Maryland only a short distance west of Chesapeake Bay, excepting in the south.

UNITED STATES.—Map of Ohio. Showing the areas covered by the principal limestone formations. No scale. Geological Survey of Ohio, Fourth Series, Bulletin No. 4, Columbus, 1906.

The limestones of Ohio cross the State from north to south in broad east and west belts, leaving a narrower north and south belt through the centre in

which limestones are lacking. The formations are shown by tints and the locations from which samples were taken for analyses.

CANADA.—Ontario (Guelph sheet embracing Wellington, Grey, Bruce and Dufferin and portions of Halton, Peel, Perth, Huron, Waterloo and Simcoe Counties). Scale, 1:250,000, or 3.95 statute miles to an inch. By James White, geographer. Department of the Interior, Ottawa, 1906.

Contours of water-depths are given in fathoms and the names and boundaries of electoral districts are in red.

CUBA.—New and Complete Map of Cuba. Scale, 33 statute miles to an inch. *National Geographic Magazine*, Oct., 1906.

This map by C. S. Hammond & Co., New York, uses colour in the old style to show the political subdivisions of the island. The hill features are indicated by rough hachuring. Most of the coral reefs, well mapped by the hydrographic surveys and important in the navigation of the coastal waters, are not indicated, and the southern slopes of the Sierra Maestra entirely lack the drainage features to be seen on the best foreign maps of the same scale. These wild mountain streams drain the highest range of Cuba and towards their mouths they broaden into deltas forming, more or less, broad flood plains filled with sand and rubble. With such omissions of available material, the map cannot be regarded as a "complete" map of Cuba.

BRAZIL.—Karte des Acre-Gebietes. Scale, 1:2,500,000, or 39.4 statute miles to an inch. *Pet. Mitt.*, No. 10, 1906, Justus Perthes, Gotha.

Compiled from the latest material supplied chiefly by official Brazilian maps. It shows the former and the new boundary between Brazil and Bolivia, the Peru-Brazil boundary, according to the claims of Brazil, and the neutral territory.

CHILE.—Magallanes. Scale, 1:250,000, or 3.95 statute miles to an inch. Comision Chilena de Límites, Santiago, 1906.

The map is based upon trigonometrical survey and is accompanied by a sheet showing the detailed triangulation. It depicts a region between the 51st and 52nd parallels and the meridians of 71° 30′ and 73° 40′, of which little was known and practically nothing was recorded with scientific accuracy on maps.

PERU.—Mapa Hidrológico. No scale. *Boletín* del Cuerpo de Ingenieros de Minas del Perú, No. 40, Lima, 1906.

Shows the hydrographic conditions in the Departments of La Libertad and Ancachs. Brown washes indicate the surface forms. The irrigable lands are shown and also approximate boundary between the zones of general rainfall and those of periodical and variable precipitation.

ASIA.

INDIA.—Karte des Westlichen Kashmir. Scale, 1:1,000,000, or 15.8 statute miles to an inch. Ergänzungsheft No. 155, to *Pet. Mitt.* Justus Perthes, Gotha, 1906.

Shows the hydrographic and orographic features of this region. It is based upon the Indian Surveys and illustrates a monograph by Dr. Karl Oestreich entitled "Die Täler des nordwestlichen Himalaya," which he visited in 1902 as the topographer of the Workman Expedition.

AUSTRALIA.

QUEENSLAND.—Geological Sketch Map of Queensland. Scale, 10 miles to an inch. Prepared under the supervision of Acting Government Geologist B. Dunstan and compiled by H. D. Fox. Geological Survey, Brisbane, 1905.

The map was compiled from earlier surveys and reports and shows our present knowledge of the various mineral resources of Queensland and of the formations in which they occur.

DANISH CHARTS.—Danish Hydrographic Charts. Nos. 208, Faeröerne; 209, Faeröerne med omgivende Flak; 210, Sundet; 211, Kattegat; 212, Islands Nordkyst, Skagafjordr-Langanes. Kongelige Danske Sokort-Arkiv, Copenhagen, 1905-06.

Specimens of the fine hydrographic charts issued by the Danish Admiralty.

EASTERN BALTIC.—Tiefenkarte. Scale, 1:300,000, or 47.34 statute miles to an inch. Meddelanden af Geografiska Föreningen i Finland. VII, 1904-1906. Helsingfors, 1906.

One of the admirable productions of the Finnish Geographical Society. The isobaths of the Baltic, as far west as Stettin, are shown in blue tints. The black plate is not imposed upon the isobaths, but appears separately on a transparent sheet, which is placed directly over the blue sheet, the whole giving very clear and refined expression to all the information printed on the two sheets.

FINLAND.—Handkarta öfver Finland. Scale, 1:2,000,000, or 31.56 statute miles to an inch. Meddelanden af Geografiska Föreningen i Finland, VII, 1904-1906. Helsingfors, 1906. F. Tilgmann.

A superior product combining physical and political features. Five tints show areas above sea-level and the contours of the neighbouring Baltic sea-floor are given in blue.

WORLD.

WORLD.—Verteilung der Bevölkerung auf der Erde. (1) Dichtigkeit der Bevölkerung. (2) Die Bevölkerung in Gross- und Mittelstädten, über 20,000 Einwohner. By A. Woeikow. *Pet. Mitt.*, No. 11, 1906, Justus Perthes, Gotha.

The plates illustrate the first part of a paper by Prof. Dr. Woeikow on the distribution of population over the earth under the influence of natural conditions and human activity. The first plate shows, in colours, the density of population from less than 1 to over 150 to the square kilometer. The second plate is coloured to show the percentage which the urban inhabitants constitute of the total population. In the district embraced by the North Atlantic States (U. S.), for example, the urban is over 30 per cent. of the total population.

ATLAS.

ATLAS OF THE WORLD'S COMMERCE.—Compiled from the latest Official Returns at the Edinburgh Geographical Institute. Edited by J. G. Bartholomew. (Parts 16 and 17.) George Newnes, London, and Frederick Warne & Co., New York, 1906. (Price, per Part, 25 cents.)

Part 16 of this invaluable cartographic contribution to economic geography includes world maps relating to postal, telegraphic, and cable facilities; a currency map showing, in colours, the countries with gold, silver and bi-metallic standards, and much other information; a double-page map showing the dis-

tribution of industries in Europe; four small maps, giving the distribution of the agricultural, iron, textile, and earthenware industries in the British Isles; a double-page map giving the distribution of industries in central Europe; and agricultural and industrial maps of India. The Commercial Gazetteer of countries and ports of the world is continued.

Part 17 has maps showing the meat exporting and importing countries tinted to indicate the value *per capita* of exports and imports, the distribution of cattle, with dark tint for areas where they number approximately over 50 per square mile, the distribution of sheep and hogs, the copper-mining localities of the world and the distribution of marble, guano, saltpetre, phosphate rock and kaolin. Sixteen diagrams illustrate the accompanying letter-press and the Commercial Gazetteer of countries and ports is continued, with black-and-white maps of Buenos Aires, Cadiz, Calcutta, Cape Town, Cardiff and Christiania.

ACCESSIONS TO THE LIBRARY.

OCTOBER–DECEMBER, 1906.

AFRICA.

BELLOC, H.—Esto Perpetua. Algerian Studies and Impressions. [Illustrations.] London, Duckworth & Co. 1906. 16mo.

BUDGE, E. A. WALLIS.—Cook's Handbook for Egypt and the Sûdân. (9 maps, and illustrations.) 2nd Edition. London, Thos. Cook & Son. 1906. 16mo. [*Gift.*]

CATTIER, FÉLICIEN.—Étude sur la Situation de l'État Indépendant du Congo. [Map.] Bruxelles, Vve F. Larcier. 1906. 8vo. [*Gift.*]

CHEVRILLON, ANDRÉ.—Un Crépuscule d'Islam: Maroc. Paris, Hachette et Cie. 1906. 16mo.

COLQUHOUN, ARCHIBALD R.—The Africander Land. (4 maps.) London, John Murray. 1906. 8vo.

COLVIN, AUCKLAND.—The Making of Modern Egypt. With Portraits and Maps. 3rd Edition. London, Seeley & Co. 1906. 8vo.

CROUSE, M. ELIZABETH.—Algiers. Illustrated by Adelaide B. Hyde. New York, James Pott & Co. 1906. 8vo. [*Gift.*]

EGYPT EXPLORATION FUND: Graeco-Roman Branch. The Hibeh Papyri. Part I. Edited with Translations and Notes by Bernard P. Grenfell and Arthur S. Hunt. Ten Plates. London, Egypt Ex. Fund. 1906. 4to.

GLEICHEN, COUNT. *Editor.*—The Anglo-Egyptian Sudan: A Compendium prepared by officers of the Sudan Government. Vol. 1: Geographical, Descriptive and Historical; Vol. 2; Routes. (Illustrations.) London, H. M. Stationery Office. 1905. 2 vols., 4to.

HAYES, A. J.—The Source of the Blue Nile . . . . With a Note on the Religion, Customs, etc. of Abyssinia. And an Entomological Appendix by E. B. Poulton. Illustrations and Maps. London, Smith, Elder & Co. 1905. 8vo.

HILDEBRANDT, DR. med.—Eine deutsche Militärstation im Innern Africas. [Illustrated.] Wolfenbüttel, Heckner. 1905. pr., 16mo. [*Gift.*]

HOLLAND, TREVENEN J., AND HOZIER, HENRY.—Record of the expedition to Abyssinia. Compiled by Order of the Secretary of State for War. London, H. M. Stationery Office. 1817. 2 vols. and Case of Maps. 4to.

HOLLIS, A. C.—The Masai. Their Language and Folklore. Introduction by Sir Charles Eliot. (Illustrations.) Oxford, Clarendon Press. 1905. 8vo. [*Gift.*]

KANDT, RICHARD.—Caput Nili. Eine empfindsame Reise zu den Quellen des Nils. Mit 12 Lichtdrucktafeln und einer Karte. Berlin, Dietrich Reimer (Ernst Vohsen). 1904. 8vo.

LEONARD, ARTHUR GLYN.—The Lower Niger and its Tribes. (Map.) London, Macmillan & Co. 1906. 8vo. [*Gift.*]

LLOYD, ALBERT B.—Uganda to Khartoum. Life and Adventure on the Upper Nile. Illustrations. New York, E. P. Dutton & Co. 1906. [*Gift.*]

MADAN, A. C.—Wisa Handbook. A short Introduction to the Wisa Dialect of North-East Rhodesia. Oxford, The Clarendon Press. 1906. 16mo. [*Gift.*]

MARCEL, JEAN.—Terre d'épouvante. Dix-huit mois dans les domaines du Souverain Léopold. Paris, (VIe), Gustave Ficker. 1905. 16mo. [*Gift.*]

MOREAU, GEORGE.—Étude sur l'État Actuel des Mines du Transvaal. [Figures.] Paris, Librairie Polytechnique, Ch. Béranger. 1906. 8vo. [*Gift.*]

MÜLLER, W. MAX.—Egyptological Researches. Results of a Journey in 1904. (106 Plates.) Washington, D. C. Published by the Carnegie Institution of Washington. 1906. pr., 4to.

PAASCHE, HERMAN.—Deutsch-Ostafrika. Wirtschaftliche Studien. Abbild., &c. Berlin, C. U. Schwetschke und Sohn. 1906. 8vo. [*Gift.*]

PASSARGE, SIEGFRIED.—Die Kalahari. Versuch einer physisch-geographischen Darstellung der Sandfelder des südafrikanischen Beckens. Herausgegeben mit Unterstützung der K. Preuss. Akademie der Wissenschaften. Tafeln, Abbildungen, &c. Berlin, Dietrich Reimer (Ernst Vohsen). 1904. [2 vols.: Text and Maps.]

PREUMONT, G. F. J., AND HOWE, J. A.—Notes on the Geological Aspect of some of the North-Eastern Territories of the Congo Free State. With Petrological Notes. [Map and two Plates.] *From the Quarterly Journal of the Geological Society* [*London*] *for August 1905, Vol. lxi. pr., 8vo.* [*Gift from J. Allen Howe, London.*]

REICHARD, PAUL.—Deutsch-Ostafrika: Das Land und seine Bewohner. Vollbildern. Leipzig, Otto Spamer. [1890?] 8vo.

SAVORY, ISABEL.—In the Tail of the Peacock. [Morocco.] Illustrations and Portrait. London, Hutchinson & Co. 1903. 8vo.

SHAW, FLORA L. (LADY LUGARD).—A Tropical Dependency: An Outline of the Ancient History of the Western Soudan with an Account of the Modern

Settlement of Northern Nigeria. [Two maps.] London, James Nisbet & Co. 1906. R. 8vo.

TIEDEMANN, ADOLF v.—Aus Busch and Steppe. Afrikanische Expeditionsgeschichten. Mit Text-illustrationen. Berlin, Winckelmann & Söhne. 1905. 8vo. [*Gift.*]

TIEDEMANN, ADOLF VON.—Mit Lord Kitchener gegen den Mahdi. Erinnerungen eines Preussischen Generalstabsoffiziers an den Englischen Sudanfeldzug. Mit 5 Kunstbeilagen und 2 Kartenskizzen. Berlin, C. U. Schwetschke und Sohn. 1906. 8vo. [*Gift.*]

TOQUE, GEORGES.—Essai sur le Peuple et la Langue Banda. (Région du Tchad.) Avec photogravures. Paris, René Roger. 1905. pr., 16mo. [*Gift.*]

VON FRANÇOIS, CURT.—Die Erforschung des Tschuapa und Lulongo. Reisen in Centralafrika. Abbild. und Karten. Leipzig, F. A. Brockhaus. 1888. 8vo.

WISSMAN, HERMANN VON; WOLF, LUDWIG; VON FRANÇOIS, CURT; MUELLER, HANS.—Im Innern Afrikas: Die Erforschung des Kassai. Dritte Auflage, mit Titelbild, Abbild. und 3 Karten. Leipzig, F. A. Brockhaus. 1891. 8vo.

WURZ, F.—Die mohammedanische Gefahr in Westafrika. *Basler Missions-Studien, Heft 21.* Basel, Missionsbuchhandlung. 1904. pr., 16mo. [*Gift.*]

AMERICA.

BANKS, A. BLEECKER.—Albany Bi-Centennial. 1686-1886. Historical Memoirs. [Illustrated.] Albany & N. Y., Banks & Bros. 1888. 8vo.

BARRANTES, FRANCISCO MONTERO.—Elementos de Historia de Costa Rica. San José de Costa Rica, Tip. Nacional. 1892-1894. 2 vols. 8vo. [*Gift from the Biblioteca Nacional de San José de Costa Rica.*]

BARRANTES, FRANCISCO MONTERO.—Geografía de Costa Rica. [With Map and Illustrations.] Barcelona, Tip. Lit. de José Cunill Sala. 1892. 8vo. [*Gift from the Biblioteca Nacional de San José de Costa Rica.*]

BECK, LEWIS C.—Botany of the Northern and Middle States; or a Description of the Plants found in the United States north of Virginia, &c. Albany, Webster and Skinners. 1833. 12mo.

BROWNE, D. J.—Trees of America; Native and Foreign, &c., &c. Illustrated. New York, Harper & Bros. (1846) 8vo.

CHAILLÉ-LONG, CH. (*Editor*).—Les Combattants Français de la Guerre Américaine 1778-1783. Listes établies d'après les documents authentiques déposés aux Archives Nationales et aux Archives du Ministère de la Guerre. Publiés par les soins du Ministère des Affaires Étrangères. [With Portraits.] Washington, Imprimerie Nationale. 1905. *58th Congress, 2nd Session, Document No. 77.* [*Gift from the Editor.*]

CHARLESTON, SOUTH CAROLINA.—Year Books of the City: 1899, 1902-1904. (Illustrations.) (Charleston, [Various Publishers.]) 1899-1905. 4 vols. 8vo.

CORTHELL, E. L.—History of the Jetties at the Mouth of the Mississippi River. (Illustrations and Maps.) New York, John Wiley & Sons. 1880. 8vo.

GARCIA, (FR. GREGORIO).—Origen de los Indios de el Nuevo Mundo, y Indias Occidentales. Madrid, Francisco Martinez Abad. 1729. [2nd Edition.] folio.

GAUTIER, FERDINAND.—Chili et Bolivie. Étude Économique et Minière. [Map.] Paris, E. Guilmoto. (1906) pr., 8vo.

GOBAT, ALBERT.—Croquis et impressions d'Amérique. (Illustrations.) Berne, Gustave Grunau. [1905.] 8vo.

HEMANS, LAWTON T.—History of Michigan. [Illustrated.] Lansing, Mich., Hammond Pub. Co. 1906. 16mo. [*Gift.*]

HIMMELWRIGHT, A. L. A.—The San Francisco Earthquake and Fire. A Brief History of the Disaster.... with Special Reference to the Efficiency of Building Materials. (Illustrations.) New York, N. Y., Roebling Construction Co. (1906) 4to. [*Gift.*]

HORNADAY, WILLIAM T.—Camp-Fires in the Canadian Rockies. Illustrations by John M. Phillips. Two maps. New York, Charles Scribner's Sons. 1906. 8vo. [*Gift.*]

HUARD, CHARLES.—New York comme je l'ai vu. Texte et dessins par ———. Paris, Eugène Rey. 1906. sq. 8vo.

JAMES, GEORGE WHARTON.—The Wonders of the Colorado Desert. (Southern California.) With... Sketches from nature by Carl Eytel. Boston, Little, Brown & Co. 1906. 2 vols. 8vo. [*Gift.*]

JOHNSON, CLIFTON.—Highways and Byways of the Mississippi Valley. Illustrated. New York, The Macmillan Co. 1906. 8vo. [*Gift.*]

JOHNSON, WILLIS FLETCHER.—Four Centuries of the Panama Canal. Maps and illustrations. New York, Henry Holt & Co. 1906. 8vo. [*Gift.*]

MINUTE BOOK OF THE COMMITTEE OF SAFETY OF TRYON COUNTY, the Old New York Frontier. Now Printed Verbatim for the First Time. Introduction by J. Howard Hanson. Notes by Samuel Ludlow Frey. (Illustrations.) New York, Dodd, Mead & Co. 1905. 8vo.

MOODIE, SUSANNA.—Roughing it in the Bush; or Life in Canada. New York, De Witt & Davenport. [1854] 12mo.

PECK, ANNIE S.—Climbing Mount Sorata. (With six Plates.) *Extracted from Appalachia, Vol. XI, No. 2.* [Boston, 1906.] pr., 8vo. [*Gift from the Author.*]

PETRE, F. LORAINE.—The Republic of Colombia; The Country, Its People, Its Institutions and Resources. Illustrations and Map. London, Edward Stanford. 1906. 8vo. [*Gift.*]

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BOOK NOTICES.

Fighting the Polar Ice. By Anthony Fiala. With an Introduction by W. S. Champ and Reports by William J. Peters, Russell W. Porter and Oliver S. Fassig. xxii and 301 pp., numerous photographs and sketches by the author and 9 views from painting in colour, Appendices and Maps. (No Index.) Doubleday, Page & Company, New York, 1906. (Price, $3.80.)

Mr. Fiala's book is very handsomely produced and his photographs, nearly all taken by himself, have scarcely been equalled in other works on polar exploration. The book is well written and there is not a dull page in it, for though the outcome of Mr. Ziegler's second and last polar enterprise was not great in geographical achievement, it abounded with the most thrilling adventures. The book will make the impression upon students of polar research that Mr. Fiala possesses, in large measure, the qualities of leadership that are essential to success in such enterprises; that not a few of the men in his party were utterly unfit for participation in an Arctic expedition; that if they had been more adequate, he would probably have been able to make some degrees of latitude to the north on his first attempt; and that luck, which is so important an element in determining success or failure, was dead against him. It was no fault of his that his ship was lost; or that an impassable lead opened before him on his second northern sledge journey, when he attained 82°. The members of his scientific staff and the officers of the ship stood by him nobly and shared with him the credit for fidelity to duty and for achievement within the limits of possibility.

The book is a popular account of the expedition. The scientific results, including some surveys and meteorological and magnetic observations, will be published by the Ziegler Estate. It might be well to acknowledge somewhere the great boon to the expedition which the advanced supply stations made by Baldwin proved to be. He at least succeeded in transferring an immense quantity of provisions to the north, without which things would have gone very hard with the Fiala party, compelled as it was unexpectedly to live two years in the Arctic without any replenishment of its supplies.

It is needless to summarize here the story which Mr. Fiala tells in graphic

detail. All who read his book and study his pictures will get a better idea of the enormous difficulties of making progress across the pressure ridges of the floe ice than they have obtained from most other narratives. He was able to take some remarkable views of the maze of towering ice blocks that impeded his way on the sea ice. When he reached 82° on his last attempt to make a high northing, he had been able to average only 5 miles a day, and ahead of him was a wide open lead which he could not circumvent. The time was too far advanced to make a surpassing northing even if he could get across the lead and find better travelling beyond it. There were other circumstances of an imperative nature that compelled him to relinquish, in bitterness of spirit, all hope of carrying out the main purpose of the expedition.

The most suggestive part of the book is Mr. Fiala's chapter "An Afterword," which he especially addresses to men who may contemplate a venture for the pole. His experiences in the Baldwin expedition and in that which he himself commanded convinced him that the most feasible method of attack would be to use a small, strongly-built drift ship so modelled that she would rise with ice pressure. He would put her into the ice by way of Bering Sea, or at Teplitz Bay, where he spent two winters. With a drift ship as a base, the sledge party would have the advantage of a high latitude from which to start poleward and would also escape the pressure ridges that extend north from all Arctic lands. He would use both ponies and dogs on the sledge journey. He has had much experience with ponies from Siberia in Arctic sledging, has found that in rough travelling they outdistance the dogs and drag heavier loads, and he is fully convinced of their value for sledge purposes. He fed them on compressed hay and oats and killed them for dog food as the sledges became empty. He gives his views at length on numerous details of equipment for such an expedition.

Canada. The New Nation. By H. R. Whates. xvii and 284 pp., and 17 photographic Illustrations. E. P. Dutton & Co., New York, 1906.

Mr. Whates is a newspaper writer who went to Canada to study the emigration movement. Desiring to make his studies thorough and practically useful, he was content with nothing less than first-hand knowledge. He travelled in the steerage with a shipload of emigrants from Liverpool. Landing at St. John, New Brunswick, in midwinter, he put to a practical and personal test the question whether Canada, in that bleak season, would yield subsistence to a new arrival. He secured a job at shovelling ashes at $1.50 a day. He found, on the whole, that an immigrant, willing to turn his hand to anything at the first wage offered, need not starve. Then he worked in a lumber camp at keeping the haulage tracks in good condition, to learn what chance the ordinary immigrant has in the lumbering industry of the maritime provinces. He found that at times there is a scarcity of labour, when a green hand may earn his board and twenty dollars a month; but it takes time to learn how to fell trees and handle logs. So he went on across the continent. He learned that the large Canadian cities of Quebec and Ontario offer few inducements to unskilled labour; that the efflux of mill hands and such-like people into the manufacturing cities cannot wisely be encouraged; that many workless men are stranded during the long, hard winters at Winnipeg; that the goal of the immigrant should be independence as a land owner; and that young women who will go into domestic service can earn from $20 to $25 a month.

The author made a very close study of farming and farm life on the prairies

of the great wheat provinces. He travelled far north of the Canadian Pacific R.R., sought for a desirable "free farm" and duly paid for his preliminary title to it so that he could tell immigrants the considerations they must have in view in seeking new homes and the methods of acquiring them. He also investigated the sheep runs and the horse and cattle ranches of Alberta, and the valley farming among the mountains of British Columbia.

The chapter of largest geographical interest, "The Great Clay Belt," relates to the region in northern Ontario which is to be crossed by the Grand Trunk Pacific R.R., the projected trans-continental line. Mr. Whates visited this little-known region, which, it had been reported, would offer great opportunities to the immigrant as soon as transportation is provided. He says that the clay belt is an indubitable fact, and that it is about 200 miles wide and 1,000 miles long. But it is also an interminable forest available for agriculture only when it shall have been cleared. The problem which confronts the settler is therefore different from that which he meets on the prairie. He will have to clear land before he can sow or keep live stock. The counter-balancing advantages are that he may sell his marketable logs, that timber for housebuilding will be cheap, and that firewood will be plentiful. The land will grow anything from grain to potatoes, and drought is unknown. There is no doubt of the great promise of this region, but the hardiest of pioneers will be required to clear the farm lands.

The book should be of great value to settlers and immigrants in Canada. The author got close to every phase and aspect of the situation. He spared no pains to obtain intimate acquaintance with conditions so that he might tell the exact facts and offer helpful suggestions. Being a writer of experience and ability he knows how to express clearly just what he means, an advantage which, of course, adds much to the value of his book.

Russia. Travels and Studies. By Annette M. B. Meakin. xx and 450 pp., many Illustrations, 4 Maps, and Index. Hurst & Blackett, London, 1906.

The book is almost encyclopædic in the amount of information it gives about nearly every part of European Russia and Trans-Caucasia. Crowding the pages with so many facts would scarcely tend to increase the readability of the volume if it were not that the author is especially interested in these facts, observed them herself and has a correct impression of what will interest the general reader. She rather skillfully avoids the hackneyed and her chapters are solid without sacrifice of entertainment. She pictures many phases of life, sprinkles bits of history among her descriptions, and brings into strong relief the characteristics and individuality of the leading cities. Chapters are devoted to the German population, the Lutheran Church, the peasants, factories and factory hands. Many things not commonly known among the more Western countries excited her curiosity and her inclination to investigate, with results that will interest the majority of intelligent readers. Her earlier works deal chiefly with Russia's Asian possessions and in the present volume she gives the quintessence of her studies of European Russia. The many photographic illustrations are excellent.

The Preliminary Geography. By A. J. Herbertson. viii and 149 pp. 72 Illustrations. The Clarendon Press, Oxford, 1906.

This volume is one of "The Oxford Geographies" which Dr. Herbertson has now in preparation. He finds that there is a demand for text-books in which physical and political geography, usually treated in unrelated sections, shall con-

tain the information on these topics which is expected from candidates for preliminary junior and senior examinations. This first volume is largely descriptive, giving definite pictures of the different regions of the globe, with an outline of the salient topographical features and explanations of the phenomena described. The author has endeavoured to select only those geographical facts that are of greatest educational importance and practical utility, and the contents of the book may fairly be expected to be learned by the pupil. Many black-and-white maps, showing chiefly topographical, meteorological, and economic aspects, are included.

Notes d'un Voyage chez les Falachas. Par Jacques Faïtlovitch. 27 pp. Ernest Leroux, Paris, 1905.

The Falashas are Abyssinian Jews whose presence there was revealed by the Scottish explorer, James Bruce. It is now known that their fathers lived in this region ages ago, though their coreligionists were scarcely aware of their existence. The later explorers brought considerable information concerning them and Baron Edmond de Rothschild sent Mr. Faïtlovitch to make a more thorough study of these Jews.

This pamphlet gives the results of his investigations. He found the Falashas at Axum and other places in Abyssinia. They say that the name Falasha indicates that they are exiles or immigrants, and not aborigines. A few of them live in Tigre, but most of them are found in Amhara. They do not speak the language of their fathers but the tongues and dialects of the Abyssinian plateau. Hebrew is entirely unknown to them. Their colour is more or less black, but they claim to have descended from Abraham, Isaac and Jacob, and their physiognomy, the persistence of their religious condition, and various traits of character justify their pretensions. The religion they profess is Mosaic, modified by the literature accessible to them. In their prayers they ask the Deity to restore them to Jerusalem, their mother country. Agriculture is their special occupation, but over fifty years ago their lands were taken from them and they were reduced to working for others. The pamphlet is filled with information about this isolated and interesting people.

Die Mohammedanische Gefahr in Westafrika. Von F. Würz. 26 pp. Verlag der Missionsbuchhandlung, Basel, 1904. (Price, 5 cents.)

The author is secretary of the Basel Missionary Society, which has achieved remarkable success in its African industrial schools. While the Colonial Powers were parcelling out the whole of Africa among themselves, a conquest of a different kind was in progress in which the human factors were native Africans and Arabs. The conqueror is Islam and the results of the conquest are partly ethnological and partly political, as well as religious.

The author says that though the districts of Gomoa and Agyimako on the Gold Coast have long been under missionary influence, Islam is now making progress there. The Mohammedans there are not immigrants, but nearly all of them are natives. Their chief priest is a former Wesleyan missionary who took himself, his chapel, and church society, into the Mohammedan fold. Hitherto the lower Niger was inhabited only by heathen tribes. In 1898 there was scarcely a Mohammedan south of Idda. They are now found everywhere along the river as far as Abo, having spread over a region about 100 miles south of their earlier limit. It is not likely that in 1910 there will be any heathen communities on the lower Niger. The important commercial town of Lagos, with 42,000 inhabitants,

is more than half Mohammedan. Islam is spreading in the interior of Sierra Leone and has nearly completed the conquest of the whole of Senegal. Its victories in Africa have been won in various ways by ruthless conquerors, by peaceful traders and by an army of priests and dervishes.

The monograph gives much space to the Fulba and Hausa peoples of the Sudan, who have been chiefly instrumental in extending Islam south of that belt. He attributes the potency of Mohammedan influence to the facts that the African follower of Islam has more intellectual affinity with the heathen blacks than the white missionaries, and that he is a neighbour of the black and not a foreigner. The proselytism of the Mohammedan orders is described. The writer believes that the Protestant missionary societies in West Africa should redouble their efforts to improve their foothold.

Eine deutsche Militärstation im Innern Afrikas. Von Dr Hildebrandt. 80 pp. and many Illustrations. Heckner's Verlag, Wolfenbüttel, 1905. (Price, M. 2.25.)

The book is attractive, both in its letterpress and illustrations. Such books should be encouraged, for they show the transformation now going on from barbarism to civilization. The author was a physician at the Government station of Muansa on the southern coast of Victoria Nyanza, 800 miles from the ocean. His book is devoted to all phases of the station life and work—the erection of the buildings, the station routine, native labour, navigation of the lake, postal connections with the sea, relations between the Government and the natives, wars, and other happenings. The region concerned is comparatively small, and it is doubtful if a better account has been written of the gradual transformation of a barbarous district by elementary civilization. Practically all European vegetables, as well as those of the tropics, are brought to perfection every month in the year in the gardens of this region.

Essai sur le Peuple et la Langue Banda. Par Georges Toqué. xi and 130 pp., and Illustrations. J. André, Paris, 1904.

Mr. Toqué says it is almost impossible to learn the history of the native African races he has met, because they themselves are not certain what occurred more than fifteen or twenty years before they first saw Europeans. Their traditions have little value. The natives have no idea of time and a chronological statement of facts is impossible. However, he collected considerable information about the Banda, which he regards as reliable. He says that the cradle of the Banda was the valleys of the upper Kotto and Wakka which are tributary to the Kwango affluent of the Mobangi River. From this centre, they have spread on all sides and his sketch map shows them in the region of the water-parting between the Mobangi and the Shari River systems. They are divided into many groups. The author describes their political organization, some of their customs and gives examples of their folklore. The part of the book devoted to the language is evidently the work of a layman, and is open to criticism on philological grounds.

Die Innere Kolonisation Japans. Von Dr. Kumao Takaoka. x and 106 pp. Duncker & Humblot, Leipzig, 1904. (Price, M. 2.10.)

The book is a history of the interior colonization, under state auspices, of Japanese, the reasons for it and the results. This removal from one part of the

Empire to another has been of national and economic importance, and to it is due the solution of the agrarian question in the older parts of Japan. The movement has meant, in a general way, the distribution of lands adapted for cultivation. It has been the policy to induce agriculturists and others living in the congested parts of Japan to settle in unoccupied or in thinly peopled areas. The details of this policy have been changed from time to time but the policy itself has been promoted by the Government for centuries. Dr. Takaoka traces the history of the movement as far back as the records permit. His able monograph is a valuable contribution to the study of some of the economic results due to the redistribution, to some extent, of the Japanese people in their home territory.

Mit Lord Kitchener gegen den Mahdi. Von Adolf von Tiedemann. 206 pp., five portraits and two sketch maps. C. A. Schwetschke & Son, Berlin, 1906. (Price, M. 4.)

Major von Tiedemann, a Prussian Staff officer, accompanied Lord Kitchener in his campaign against the Mahdi. He gives many interesting and important incidents of the journey up the Nile and of the great battle in which the Mahdi was defeated and Omdurman was captured. His series of sketches is taken from the letters, diary and reports he wrote at the time.

Geographical Gleanings. By the Rev. F. R. Burrows. 75 pp. George Philip & Son, London, 1906. (Price, 1s. 6d.)

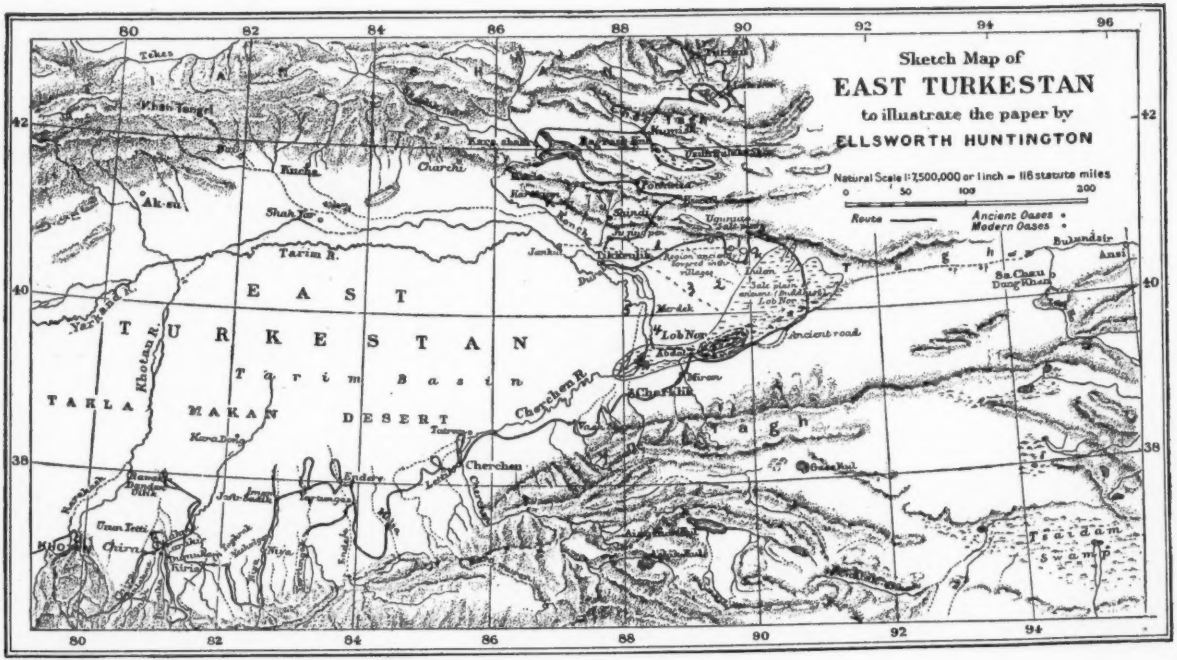
This book brings together facts that are likely to help teachers of geography. In Part 1 the author expresses his views on the great value of geography as a school subject. In Part 2 he arranges the order in which he believes a teacher should study the many cognate sciences before taking up class work; and offers suggestions for work in the school.

Leitfaden der Erdkunde für höhere Lehranstalten. Von Dr. Adolf Pahde. (1 Heft: Unterstufe.) vii and 69 pp., 11 Maps and Diagrams. Carl Flemming, Glogau, 1906. (Price, M. 0.60.)

This is the first of Dr. Pahde's text-books, which are designed to give more scientific presentation of geography preparatory to University courses than has been done in many text-books.

The San Francisco Earthquake and Fire. By A. L. A. Himmelwright, C. E. The Roebling Construction Company, New York, 1906.

This quarto volume presents many facts and phenomena relating to the earthquake and fire which devastated San Francisco. The book is written with special reference to the efficiency of building materials and some lessons are drawn from the disaster. There are copious illustrations, with exterior and interior views of earthquake and fire results.


Sketch Map of
EAST TURKESTAN
to illustrate the paper by
ELLSWORTH HUNTINGTON
Natural Scale 1:7,500,000 or 1 inch = 118 statute miles
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Route
Ancient Oases
Modern Oases
EAST
TURKESTAN
Tarim Basin
TARLA MAKAN DESERT
Tarim R.
Khotan R.
Yarkand R.
Lob Nor
Ancient road
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Cherchen R.
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Tagh
Tsaidam
Khan Tengri
Kucha
Aksu
Shah Yar
Karashahr
Turfan
Hami
Bulundair
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Keriya
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